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SOME ESSENTIAL POINTS IN THE ANATOMY AND SURGERY OF THE THYROID GLANDS.*

JOHN F. BARNHILL, M.D., F.A.C.S.,
Professor of Otology, Rhinology and Laryngology, Indiana University School of Medicine.
INDIANAPOLIS.

In a paper before the American Laryngological Society in 1914 I gave reasons why the otolaryngologist should perform the surgery of the head and neck. Dr. Joseph Beck and others had made similar arguments. The anatomic relations of the larynx and pharynx to the structures of the neck, including the thyroid, have always been obvious; and lately the pathologic relations of these regions have come into prominence. Shurley, Beebe, and others have ably discussed this relationship from the standpoint of the laryngologist. The surgical progress leading the operator from the performance of simple intralaryngeal operations to the more open surgery of the head and neck has been both natural and necessary. The pathologic processes occurring in the original fields of the specialty led frequently to external disturbances which more and more required surgical interference from without. For example a discharging ear sometimes led to brain abscess or sinus thrombosis, requiring brain surgery on the one hand or jugular ligation and excision on the other. The cervical lymph nodes of the neck are frequently infected secondary to tonsil or other throat disease and requires external surgery. Laryngeal stenosis, laryngeal infection or malignant growths of the larynx frequently call for immediate external surgery, high or low tracheotomy, pharyngotomy or laryngectomy. The performance of all these operations by the laryngologist has familiarized him with the surgical anatomy of the head and neck, and with the surgery of these regions. His present knowledge of the diseases of both the interior and the exterior of the head and neck should, therefore, entitle the laryngologist to perform the surgery of both regions, and, provided his anatomical knowledge and surgical training are thorough, he should, because of this intimate understanding of both exterior and interior regions, be best able to perform such work.

An accurate understanding of the surgical anatomy of the thyroid gland and its environment is a first essential to success in thyroidectomy. This cannot be obtained solely from text-books and therefore repeated dissection of the neck with special reference to the relations of the thyroid is an essential preliminary training. I shall not discuss the details of this anatomy further than is necessary to emphasize the points that are of paramount importance to safety in thyroid operations. These important points are:

1. The large blood supply which enters the gland chiefly at the upper and lower poles.

2. The capsule of the thyroid, or better capsules, for there are two, an outer or surgical capsule and an inner or glandular capsule. The latter is the one usually in mind when the term thyroid capsule is used. The importance of knowing these capsules well lies in the fact that the thyroid may be rapidiy and completely separated from its enveloping tissues in the neck provided the work of separation be carried out entirely between the two capsules. Attempts at separation either outside the surgical capsule or inside the glandular capsule are slow, uncertain, and may be attended or followed by serious consequences, as I shall presently point out. The distance between the surgical and glandular capsules is normally slight, and may be obliterated in case of great hypertrophy of the thyroid, inflammation in or adjacent to the gland, or in malignant disease. The intracapsular space is normally filled with loose areolar tissue and surrounds the entire thyroid gland. The isthmus of the thyroid is in closer contact with the trachea and hence one gets the impression during the process of removal of the isthmus that the capsules are rather closely adherent to the windpipe.

3. The parathyroids. In the connective tissue space between the two capsules the parathyroid bodies are usually found, and this fact alone gives great importance to a study of both the capsules and the intracapsular space.

Undoubtedly one of the most interesting chapters in the progress of surgery has been written in

*Read before the Middle and Western Sections of the American Laryngological, Rhinological and Otological Society, St. Louis, February 22, 1916.

the experimental and clinical study of the thyroid and parathyroid glands. Indeed few triumphs of any kind equal the conquest of thyroid disease. Thirty-five years ago practically all cases of thyroidectomy died from early tetany or from later trophic changes. The real difficulty from the thyroid operation then lay in the parathyroid glands, for, because of the apparent insignificance of these structures, the danger resulting from their removal was not suspected, and was determined only by much experimentation and clinical observation on the part of such able men as Weiss, Biedl, Erdheim, Pineles and Kocher of Europe, while Thompson, Mayo, Beebe, Ochsner and others have been tireless and efficient workers in America. Early thyroid operators believed that death was due solely to the removal of the thyroid gland, and it was not until as late as 1902 that Jeandelize was able to state the real cause of tetany and death following thyroidectomy. In that year he made the statement at present everywhere accepted as a fact, that insufficiency of thyroid secretion causes chronic nutritional disturbances while lack of parathyroid tissue causes tetanic crises.

The parathyroid glands are among the strangest structures of the human economy. Small and inconstant in number, often so small and hidden that they are very difficult to find even during the most careful dissection by experts, their actual importance as vital organs must not be overlooked. It has been proven repeatedly that death follows the complete removal of all the parathyroid glands in animals, including man. In some instances after supposed removal of all, death did not occur and it was thought, therefore, that there were exceptional cases. Further observations on these same animals showed, however, that one or more parathyroids had been overlooked in the dissection, and these had proved sufficient to carry on the life-sustaining function, whatever it may be. Subsequent removal of these remaining parathyroids in any such animals has always resulted in death from tetany, usually before the tenth day.

Investigators seem to agree that the normal, at least the most constant number of parathyroids is four, and that the average number in a series of examinations is less than four. The number according to competent authority may vary from one to eight. It is believed by some that when only one or two have been found in a given case that others were present, but because of the difficulty in finding them, were overlooked. They are usually located in the connective tissue between the glandular and the surgical capsules.

Berkeley states that the average size of the parathyroid glands is 6x4x2 mm. and that the greatest weight in any set of four glands, in 125 autopsies was 5.64 grains. The minute size, the shape and the color of these little organs make them difficult to distinguish from small lymph nodes and fat.

The surgeon must not, therefore ignore a thorough study of the relationship of the parathyroid glands to the field of operation in thyroidectomy. He must know and execute that procedure which will most certainly leave the parathyroid glands in place, and with the least possible amount of traumatism to the glandules or to their blood supply. Early operators almost invariably removed the parathyroids along with the thyroid gland, without knowing that they did so, and without knowing

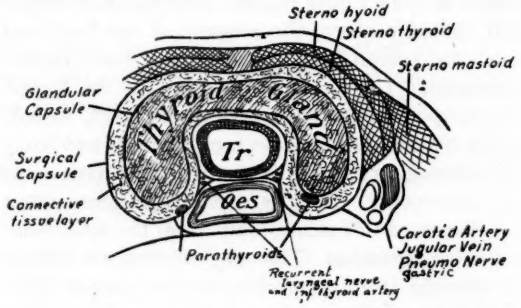

Fig. 1. Modified from Binnie ("Operative Surgery"); and from personal dissection by author. The relationship of every important structure is here shown. Note that the recurrent laryngeal nerve and the inferior thyroid artery have a sheath of their own, and lie entirely outside both capsules of the thyroid gland. This fact makes it important not to expose the recurrent nerve, in order to avoid its injury.

that to do so would certainly be followed by serious consequences. Thus it happened that a careful study of the thyroid gland after it had been removed, often led to the discovery that the little parathyroid glandules had been hulled out along with the thyroid gland, and were found clinging to the glandular capsules or lying in its covering of connective tissue. In such cases if only one or two parathyroids had thus been removed, but two or three more fortunately left behind, tetany was possibly avoided. Since the practice of removing all of the thyroid has now been abandoned the danger from tetany is much lessened for the obvious reason that, even though the operator followed a faulty technic regarding the preservation of the parathyroids, he would, of course, not remove these glands except on one side, leaving the glands of the opposite side intact and uninjured. It is nevertheless highly desirable not to injure or remove any of the glandules, and, by following the most approved technic, to so preserve them is usually possible. Kocher, Halsted, Mayo and others have devised safety methods, but the

descriptions of such methods are not entirely clear, at least not to the beginner.

Lying as it does over the lower portion of the larynx and upper portion of the trachea within its capsules as above described, the thyroid gland or one or more of its lobes may be removed with both ease and expedition. If, therefore, a mere removal were all that must be considered the operation of thyroidectomy would undoubtedly be viewed with less concern than is at present the case. Surgeons are now fully aware that mere removal of the desired portion of the gland is not all that is required in the performance of this operation. Important and even vital structures which are difficult of recognition must not be injured or removed and hence greater skill is often required to avoid these difficulties than is necessary to accomplish the removal of the thyroid itself.

The chief dangers to be avoided in thyroidectomy are: (1) the anesthesia; (2) hemorrhage and shock; (3) suffocation from collapse of the trachea; (4) injury to the recurrent laryngeal nerve, and (5) injury to or removal of one or more parthyroid bodies. In addition to these there is always grave danger in exophthalmic goiter operations due to the toxic state of the patient, such persons being poor operative risks.

The question of hemorrhage, shock, anesthesia and the toxic state of the patient are well discussed in the literature and there is no occasion to take them up here. But how best to avoid suffocation from collapse of the treachea, to avoid injury to the voice from operative disturbance of the recurrent laryngeal nerve and, above all, to follow a procedure that will leave the parathyroid bodies intact, may I believe be discussed further with profit.

The fear of collapse of the treachea, resulting in suffocation of the patient should not seriously disturb any well-trained laryngologist. Such an occurrence is rare and its proper management requires only that a tracheotomy tube be handy at the moment the isthmus is dissected away from the trachea. Should collapse occur as a result of previous pressure and absorption of the tracheal rings, as shown by the disturbed respiration of the patient, the front wall of the trachea should be lifted up and incised and the tube inserted.

The method which I have followed in a considerable number of cases is, I believe, as free from the above dangers as possible. No claim of originality is made, but considerable research into the anatomy has been pursued with a view to clarifying if possible some points looking toward a safe technic in the surgery of the thyroid.

If the patient shows marked systemic disturbances, as in case of exophthalmic goiter, it is wise to secure the advice and cooperation of a skilled internist. The patient should rest in bed for a few days under the least exacting circumstances. The pulse should be reduced to or below 120, if possible. The preparation for the anesthetic is practically the same as for any other major operation. The neck should be sterilized by the use of alcohol and iodine. A piece of gauze one yard square should be placed over the head and the free ends brought down over the neck and chest where they are attached at some tension. A slit large enough to expose the field of operation is cut in the gauze. The patient's body is placed with the head up at an angle of about 30°.

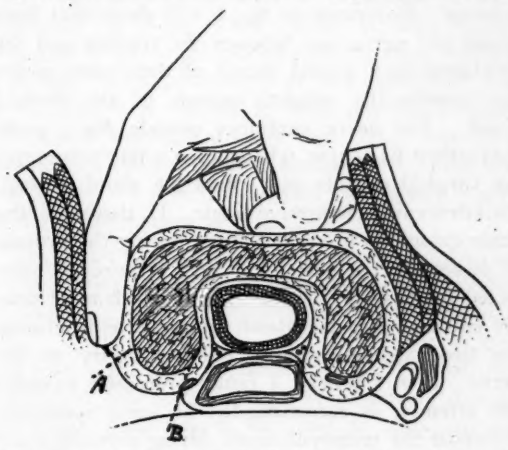

Fig. 2. Shows lateral finger dissection of gland to safety line, A.B.

The Kocher horse-shoe incision is made through the skin and platysma and the flap reflected upward. A perpendicular incision is made over the center line of the trachea from the lower part of the thyroid cartilage downward to the fourth tracheal ring. This incision opens the surgical capsule, enabling the operator to insert the index finger under the sternohyoid and sterno-thyroid muscles, and, working thus in the loose connective tissue between the surgical and glandular capsules, to rapidly separate the whole of the anterior surface of the lobe to be removed from the structures which overlie it. The overlying muscles are then cut and turned back from the field of operation. The finger is next inserted under the superior pole of the lobe, and is carried downward along the side of the trachea, still working between the two capsules as far as the entrance into the thyroid of the inferior thyroid artery. Up to this point finger or other blunt dissection is safe and rapid, as no structure of importance is likely to be injured. Of course many superficial veins and the superior thyroid

artery and vein must be ligated before this stage of the operation is reached, for the reason that immediate safety of the patient depends upon checking all blood as soon as any vessel is seen or severed. A dry field in which the operator may see all the essential steps of his work will reward him for his trouble in ligating even tiny arterial twigs, and the patient will be saved from inevitable shock due to any considerable loss of blood.

When the inferior thyroid artery is reached in the dissection the upper half of the gland is pulled outward and forward, and the artery is ligated as close to the surgical capsule as possible. At this time the operator should recall the position of the recurrent nerve and its relation to the thyroid artery inferior. Reference to fig. 1 will show that both vessel and nerve run between the trachea and the esophagus in a special sheath of their own, which lies outside the surgical capsule of the thyroid gland. The nerve continues outside the capsule throughout its course, whereas the artery penetrates the surgical capsule and enters the gland through the intervening connective tissue. If, therefore, the outer capsule is preserved intact during the process of dissection, the nerve will most certainly be protected by it, while the artery may be clamped near the entrance into the gland substance and between the two capsules without risk of injury to the nerve. It is, I believe, a faulty procedure to make any attempt, as recommended by some operators, to expose the recurrent nerve during thyroidectomy for the purpose of avoiding its injury. In cases of malignancy of the thyroid where displacement of normal structures is the rule and where the thyroid tissue is closely adherent to its environment injury to the recurrent laryngeal nerve may at times be unavoidable. The point of entrance of the inferior thyroid artery also marks the limit of safe dissection in a downward direction since the posterior parathyroid gland lies in the connective tissue between the two glandular capsules and usually in close proximity to the artery. It may lie in a sulcus of the gland and would be removed along with the lobe should proper precaution not be taken. Hence when the finger dissection has reached the site of the artery one of two precautionary measures must be chosen to avoid injury or removal of the parathyroid glandules. Mayo advocates using a piece of gauze wrapped about the finger, using it as a brush applied closely to the glandular capsule in such way as to brush off from the thyroid lobe all the connective tissue "moss," and along with it, of course, the parathyroid glandules which are thus left behind in the wound, resting in their bed of connective tissue. This is a rapid method and when employed by one of great experience probably is entirely safe so far as the glandules are concerned. The plan which is most certain, however, in the hands of the less expert, is the one of cutting through the glandular capsule at a point above the location of the posterior parathyroid gland, and of leaving a small layer of the lobule in situ, as shown in figs. 2 and 3. It will be clear on study of these figures that by following this procedure the parathyroid glands must be left unharmed, while the risk of injury to the recurrent laryngeal nerve is minimized.

Fig. 3. Showing displacement of lobe forward by finger dissection between the capsules. Note the position of the parathyroid glands. The line A.B. indicates the incision through the glandular capsules, and the amount of glandular tissue left to make sure of safety to the parathyroids. Finger dissection may safely be carried out to point A.

Following the plan of ligating all bleeding vessels immediately and of working between the two glandular capsules as here described, the chief dangers incident to the operation itself may be avoided. In simple goiter, where the patient is not otherwise seriously affected, my personal belief is that the removal of one lobe and the isthmus of the thyroid is about as safe as is the average case of adult tonsillectomy, and that practically all patients should be expected to recover. In exophthalmic cases, however, in which symptoms of hyperthyroidism are severe the outcome is not so good. But even in this class of case if the patient is well prepared for operation by rest in bed, freedom from all excitement and reduction in the heart rate a majority may be operated upon with the full assurance that the previous toxic symptoms will in time disappear, often rapidly, and that recovery will, in due time, occur.

CATARRHAL DEAFNESS — ITS LOGICAL TREATMENT.

CLAUDE G. CRANE, M.D.,
BROOKLYN, N. Y.

When one considers the handicap to the individual and to society, of partial or complete deafness, it is amazing that so little attention is paid to its prevention and treatment.

For the purpose of this discussion we shall not consider deafmutism, hereditary or acquired syphilis, tuberculosis, oto-sclerosis, meningitis, congenital malformations or new growths, but consider the everyday problems in deafness.

Beginning at birth the eustachian tube, middle ear and labyrinth may be subjected to those pathologic changes which result in deafness, partial or complete.

There are two groups under which we may profitably consider the pathology of deafness as above defined. First, the mechanical or anatomical group, and second, the inflammatory or infectious group.

Under the anatomical or mechanical group we need to consider those departures from the normal structurally which bring about abnormal conditions in the organ of hearing. The eustachian tube, at birth, is open and should remain so throughout the life of the individual. The eustachian tube is one and one-quarter inches in length in adult life, and at birth its length is nearly the same. While it is true that its lining wall is normally in contact, the lumen is sufficiently open to admit of the free passage of air at all times. We must have the same air pressure within the middle ear as in the external auditory canal. The slightest departure from this constitutes a mechanical etiological factor in the production of pathologic changes within the middle ear. The extent of the pathologic change is in direct proportion to the extent and the duration of the mechanical blocking of the tube. A slight blocking of short duration results in dilatation of the capillaries of the middle ear and drum of the first degree. A single attack of this kind will leave nothing to show for it. That is, we are not able to detect any permanent change. Repeated attacks of this character leave their mark and eventually bring about pathologic changes in the middle ear and drum which are readily detected and most certainly lead to impaired function.

It is such attacks as these I wish to emphasize, as they readily escape attention. The patient may not be aware of such an attack or he may notice a feeling of fullness in the ear. The examiner may find only a minute dilatation of a single capillary on the membrana tympani and little or no impairment of hearing may be detected. If there is mechanical blocking of longer duration and more marked in character there are the same pathologic changes in the middle drum, but they are of such a character as to excite the attention of the patient and lead to investigation. If the investigator recognizes the condition and institutes proper treatment, the hearing will be saved, otherwise it will be impaired to greater or less degree depending on the behavior of the eustachian tube. The thickening and retraction of the drum and marked depreciation in hearing may be the result of eustachian tube blocking of first degree and intermittent type, and this may be the only direct etiological factor. It is possible to have edema of the lining of the middle ear, with exudation due to continued blocking of the tube, without infection. This, however, is of rare occurrence. In some cases it is difficult to draw the line between the purely mechanical cases and those that have blocking of the tube with infection of the tube and middle ear. I refer to the first and second stages in the inflammatory or infectious group.

All of the cases coming under this group can be cured. They should be recognized early before the damage is done to the middle ear and eustachian tube They constitute a large percentage of our cases of deafness. Mechanical blocking of the eustachian tube of this type, is invariably due to pathologic conditions in the nose or naso-pharynx or pharynx, or all three may be at fault. Pathologic tonsils may also be the cause, and the only cause. The treatment of these ears divides itself into two groups: It consists in complete removal of all etiological factors and the relief of the local condition in the tube. The details can best be considered following the description of the second group.

The infectious or inflammatory group includes all those cases in which, as a result of bacteriological invasion, there are pathologic changes in the eustachian tube, middle ear, membrana tympani and labyrinth. One or all of these may be involved. The simplest type is confined to the eustachian tube where there may be congestion alone, or this may be followed by serous exudation, and this again by the purulent stage. A mild attack may subside and leave a tube not mechanically impaired, but the severer attacks always leave an impaired tube. During the attack the treatment is confined to securing a patent tube and promotion of drainage towards the naso-pharynx. This is done by applications of astringents to the mucous membrane surrounding the opening of the tube, and instillation of cocain and adrenalin within the mouth of the

tube, followed by the instillation of argyrol. This must be done with exceeding care and only by someone familiar with the technic. Inflation of the tube is absolutely prohibited. The nasal passages are to be kept open and the nose should be blown only gently and in open fashion. When the acute attack has entirely subsided, and the eustachian tube is free of all infectious secretions, inflation with the catheter may be performed, but very gently at first, and instillations and bougies may be used. The object of the treatment is to prevent constriction of the tube, to restore its normal patency.

Whenever there is such an involvment of the tube, there is always a secondary effect on the middle ear and drum. If the pathologic process is limited to the tube, there is only the result of the blocking. When the infectious process invades the middle ear, there is a much more serious condition to deal with. The construction of the middle ear is such that one cannot have an infection of even the slightest degree without serious damage resulting. If only the stage of congestion is reached the patient is comparatively well off. It may subside without leaving damage that cannot be repaired with treatment. Here again the same treatment as that employed for the tube inflammation is used. If the stage of exudation is reached there are sure to be some adhesions and deposits which we may not be able to remove by treatment. We can only employ the measures already mentioned. If we are successful in getting drainage early through the tube the damage may be slight, especially if the treatment is followed up in the way above mentioned. We must not inflate these middle ears until all fluid exudate has either been drained through the tube or absorbed. We must not incise the drum in these cases when we have only this stage to deal with. The borderline between these cases and the next class, is not always easy to determine. When in doubt paracentesis is the safest procedure. Remember that paracentesis means the introduction into the middle ear of infection through the external auditory canal. With a perforated drum we have the added danger of blowing infectious secretion from the nose and naso-pharynx into the eustachian tube and middle ear. This may be responsible for added infection, and even mastoid involvement.

The third or purulent stage calls for immediate opening of the drum. This should be well done—not a pin prick somewhere in the drum, but a deliberate incision in the posterior inferior quadrant, beginning at the floor of the canal and carried up to the posterior fold. Whether we insert a sterile gauze drain or institute douching, depends on our opportunity to attend the case personally. Before incision the canal should be carefully cleaned with alcohol. With a purulent infection of the middle ear and drum the eustachian tube may be damaged as well. Much depends on the early drainage and prompt subsidence of the infectious process. Permanent perforations in the drum are, with few exceptions, the result of neglect or faulty treatment. If there is a permanent hole in the drum it is better for the ear if the tube is permanently closed. The treatment of these ears, after the infection has subsided and the drum has closed, is important. The eustachian tube should be restored to its normal patency, and gentle and frequent massage with catheter should be instituted before the deposits and adhesions within the middle ear become well organized. A discharging ear and adenoids should not be found in the same patient long after coming under observation. All the foregoing is simple straightforward practice and everyone is familiar with it. Let us ask ourselves if all of the foregoing conditions receive the treatment they should receive. If they did would we see as many damaged ears as we now do? The involvement of the labyrinth constitutes a distinct class and the limits of this paper will not permit its consideration.

From birth to the end of life, the nose, naso-pharynx, pharynx and fauces are a potential menace to the ears. There is scarcely an acute infection of any type that does not involve the upper respiratory tract. In every instance an extension to the eustachian tube and ear is possible. In the presence of such acute infections it is our imperative duty to keep a daily watch of the ears and be ready to conserve their function by prevention of involvement when possible and by proper treatment when involvement takes place. The so-called cold in the head is not to be belittled. It is a serious matter and has caused more cases of deafness than any other one cause. Any anatomical malformation in the nose that conduces to acute or chronic infection of the nasal passages proper or the sinuses, is a possible constant factor in the production of impaired hearing. Adenoid and tonsil hypertrophy and infection are likewise a source of ear trouble. Nasal obstruction of minor degree without infection may be the only cause and should receive proper attention.

The crux of the whole matter is this—any pathologic condition in the upper respiratory tract increases the chance of impaired hearing in direct proportion to the extent and duration of the pathologic condition. Prevention is the watchword. I do not believe that the importance of the nose and throat as etiological factors in the production of

deafness is adequately appreciated. It may be theoretically, but it is not in actual practice. In how many of our clinics and hospitals is there any attempt made to correlate the treatment of the ear, nose and throat cases? The rule is to have one department for the ear presided over by a group of men, and another for the nose and throat presided over by an entirely different group of men. The patient does not get a square deal unless he secures treatment instituted by someone who has obtained a complete clinical picture of the case. When we have amalgamated our ear services and our nose and throat services, we will have made a creditable advance. I am constantly seeing patients that properly belong in the two groups which we have discussed in this paper and finding on examination that they have pathologic conditions in their upper respiratory tract that are entirely responsible for the initiation and continuance of the ear involvement. So many of these have received medical care either in the clinics or in private practice that one wonders how the underlying etiological factors escaped attention. There is not an ear, nose and throat man properly grounded in the pathology of these ear conditions who does not recognize the simple facts mentioned in this paper. We want more men who will diligently apply themselves to their chosen specialty and fewer men who work at it.

There are too many deaf people. It is a disgrace to the medical profession, for we are really responsible for the greater number of cases of deafness. I appreciate that there are many hopeless cases, many that could not have been prevented. For instance a child becomes infected with a virulent scarlet fever infection, and within twenty-four to forty-eight hours the entire middle ear is destroyed beyond repair, I believe the time is not far off when the simple mastoid operation will be done for the purpose of saving the middle ear. If we can open the mastoid and drain the middle ear, thus saving the ossicles, drum and the hearing, is it not better than allowing the middle ear infection to continue with a resultant destruction of hearing? It has been estimated that among the school children in New York City, one in every hundred has sufficient impairment of hearing to be a handicap in school advancement. There are in New York City 1,000,000 school children and among them there are 10,000 children who have, in the great majority of cases, the type of deafness considered in this paper. It is with this class that we have the best opportunity for doing satisfactory work. The physician who guards the medical welfare of the family, is the one we must look to, to discover these cases and see that they receive adequate treatment, for often the specialist sees them too late.

NOTES ON THE DIFFERENTIAL DIAGNOSIS AND TREATMENT OF APPENDICITIS.*

HARRY J. PHILLIPS, A.B., M.D.,
LOUISVILLE, KY.

When the question arises as to the cause of severe abdominal pain, an examination of the blood should be made. If a distinct leucocytosis is present, the white cells of the polymorphonuclear group being increased, it is indicative of an acute inflammatory process somewhere within the body, and probably in the appendix if the symptoms are appendicular. It is, however, a great mistake to decide to operate upon this sign for it has at times proved unreliable; it is to be regarded as collateral and not as direct evidence of appendicitis.

One of the most important differentiations for the physician and surgeon is that between appendicitis and early typhoid fever. At first glance this would seem to be easy, but those of experience know that it is often difficult. Not that typhoid fever often develops suddenly, but that appendicitis may develop slowly during a mild influenzal infection, or during an attack of gastrointestinal catarrh which has been obscure in its nature. Besides, the lymphoid tissues of the appendix and nearby parts are usually involved in typhoid fever, and may cause appendicular symptoms. These localized typhoid lesions may cause pain and tenderness in the right iliac region. The absence of very severe pain, the failure to find the leucocytosis of acute inflammation, the peculiarly coated tongue, the presence of tympany, and the later development of rose spots and the Widal reaction will prove the case to be one of typhoid fever.

Care should be observed that pain and swelling in this area occurring in one who has tuberculosis is not mistaken for appendicitis. Frequently we find these signs in consumptives who are by no means far advanced in their disease. The condition is usually one of local tuberculous infection of a chronic type.

Appendicitis is separated from hepatic colic by the history of previous attacks, by the absence of jaundice, by the absence of tenderness over the gall bladder, and by the fact that in gall stone colic the pain is referred to the chest, between the right

*Read before the West End Medical Society of Louisville, Ky., February 8, 1916.

shoulder blade and the spine; whereas, in appendicitis it is not so referred.

Renal colic is differentiated from appendicitis by the pain being referred to the testicle, pelvis, or the inside of the thigh; by the fact that the urine contains blood at least microscopically; there is no excess of pain and pressure over "McBurney's point;" and there may be a previous history of renal stone. Irritability of the bladder is of no value as a differential sign, as it is often present in both renal colic and appendicitis.

Ovarian or tubal inflammation may resemble appendicitis, but a pelvic examination will usually reveal these conditions.

In some cases of intestinal obstruction the pain may resemble that of appendicitis, but the presence of obstinate constipation, the development of fecal vomiting, and the presence of a mass in the belly elsewhere than at the appendix, may enable the physician to make a differential diagnosis.

The possibility of acute hemorrhagic pancreatitis being present is to a large extent excluded by the fact that it is a very rare condition, and by the site of the pain and the onset of early collapse in this disease.

The possibility of mistaking a right-sided pneumonia for acute appendicitis is to be remembered as of great importance. In certain cases of such pneumonia, probably cases complicated by diaphragmatic pleurisy, there is complaint of pain in the region of the appendix, with tenderness upon palpation and rigidity of the right rectus, a group of symptons very suggestive of appendicitis. It may be twenty-four hours or longer before the development of characteristic physical signs make the diagnosis clear. In pneumonia we look for more rapid pulse and respiration, disturbance of the pulse-respiration ratio, some movement of the alæ nasi, cough, even if slight, some limitation of motion on the affected side, and a more continued and higher fever than belongs to a beginning appendicitis.

Occasionally rheumatic children will show rigidity of the muscular walls of the abdomen. Such cases are without temperature elevation and the symptoms are not persistent.

Treatment: There is perhaps no more difficult point for decision in medical practice than that as to the treatment of appendicitis. It is impossible to discuss the vast array of arguments for and against early operative intervention in this brief paper.

Given a case of appendicitis of the acute type, the first thing for the physician to do is to call in a surgeon as a consultant, not merely as an operator, provided a surgeon qualified to do good abdominal surgery, if it is required, is obtainable. If none such can be had, the patient is far better off without than with operation. If by medical treatment the case can be controlled and carried through the acute attack, the surgeon should not intervene, for the mortality of operations in the acute stage is far greater than where the operation is performed in the interval between attacks.

Seventeen years ago Fitz showed that 40 per cent. die after surgical measures, and 11 per cent. after medical treatment. At present the percentage of deaths in surgical cases are far less, chiefly because the cases are seen early enough or operation is performed at the time of election; but even at a much later date than that of Fitz's paper we find Coley (1899) recording 98 medical cases with 3 deaths, and 102 surgical cases with 22 deaths. When we consider Sprengel's statistics of 516 cases, 232 of which were operated upon in the interval with two deaths, and 284 during the attack with 57 deaths, the value of *delay in mild cases at least* is evident.

The plan of treatment in mild cases is as follows: The patient is required to take absolute rest in bed. An ice bag is placed over the appendix. No purgatives are given, no pain-relieving drugs are to be used unless the pain is excessive, when enough morphine may be used hypodermatically "to take the edge off the agony," but never enough to make the patient comfortable or to make him sleep, for such an effect masks the symptoms. No food is to be given by the mouth, and no drink is to be taken. If need be, liquid can be given by hypodermoclysis or by rectal injection. If the bowels move, a bed pan must be used. If the pulse is excitable, it may be quieted with a little aconite.

Under this plan of treatment the acute inflammatory process may be arrested, and the operation can be performed, if need be, after it has subsided. If at the end of thirty-six hours the symptoms are not rapidly subsiding, it is necessary to operate at once. Fowler has shown that when operation is performed in forty-eight hours 83 per cent. recover; when the cases are left to the fourth day 60 per cent. recover; to the fifth day 58 per cent.; to the seventh day 50 per cent; and to the ninth or tenth day only 33 per cent.

The signs, however, which will force the surgeon to immediate operation when the patient is first seen, or if he does not improve under treatment, are: great rigidity of the rectus muscle, persistent vomiting, a rapid pulse (above 110), an anxious countenance, and, perhaps, as an indication of some importance, a high leucocytosis. In such cases the only salvation of the patient lies in immediate surgi-

cal intervention, and each hour of delay diminishes the chance of recovery. The whole question is one of severity of infection. If there is reason to believe that the tissues are becoming infected, and that the system cannot resist the spread of the inflammation, then we must operate.

The question of deferring operation to the interval between attacks is still under debate. There are some radicals who insist that operation should be resorted to without waiting, and indeed before the appendicitis is severe. There are others who are content to wait until the storm is past, and still others who believe that, given a patient who has had but one attack of moderate severity, he may go free until another or a third attack makes it evident that a recurrence is likely to take place at any time, when she should be operated upon in the interval.

As Dennis well says: "The plan of allowing the simple catarrhal cases which are doing well after thirty-six hours to recover without immediate operation, and relegating them subsequently to the group known as interval cases, and the prompt operation after thirty-six hours when the cases are not doing well, seems to hold out the best *prospects* of recovery. The pendulum has swung too far toward indiscriminate operation. But now the introduction of the interval operation has brought the pendulum back to swing within the proper limits."

THE SURGEON'S RESPONSIBILITY.

The surgeon who hesitates to direct the necessary treatment is like the general who abandons his place on the eve of a battle or like the fire chief who retires from the ground when he finds there is a real conflagration. The surgeon has no right to allow this responsibility to rest on the shoulders of any other person, it matters not how broad these shoulders may be. He must never act purely on any other person's say so, however eminent, positive or persuasive that person may be. The surgeon's own shoulders should bear the burden and he must see to it that they do.

It is the mandate of our calling that it shall be so. This mighty responsibility is a splendid dignity. If a surgeon's shoulders are not sufficiently broad, strong and able to carry great personal responsibility, such a man belongs to some other calling. The trials and triumphs of surgery should not be for him.—J. CHALMERS DA COSTA in the *Pennsylvania Medical Journal.*

THE NERVE SUPPLY OF THE LOWER ABDOMINAL WALL AS RELATED TO THE PFANNENSTIEL INCISION.*

DAVID W. TOVEY, M.D.,
Adjunct Professor of Gynecology at the New York Polyclinic Medical School and Hospital; Chief Gynecologist to the Harlem Dispensary,
NEW YORK.

It is well recognized that in any abdominal incision it is most important not to injure the nerves supplying or crossing the cut structures, since such nerve injury predisposes to hernia by causing paralysis of muscle or atrophy from disturbed nutrition or loss of sensation.

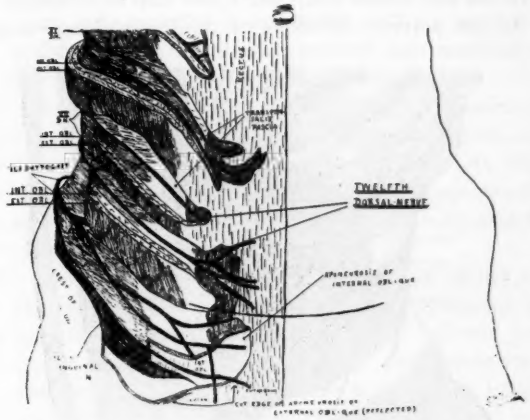

Fig. 1. Shows the nerve supply of the anterior abdominal wall below the umbilicus. (Modified from Houget.)

The nerves concerned in the Pfannenstiel incision are the anterior divisions of the twelfth dorsal and the hypogastric branch of the first lumbar. The twelfth dorsal nerve leaves the spinal canal below the last dorsal vertebra and rib, running at first behind the psoas muscle and in front of the quadratus lumborum. It pierces the transversalis and passes between it and the internal oblique two inches above the iliac spine in a downward and inward direction to the edge of the rectus where it pierces the sheath and runs behind it to about the middle of the belly of the muscle. It pierces the muscle and the anterior rectus sheath, some branches becoming cutaneous and supplying the skin below the umbilicus. It also supplies branches to the transversalis, the internal and external oblique, the rectus and the pyramidalis muscles.

The hypogastric branch of the first lumbar nerve runs between the transversalis and internal oblique about an inch above the crest of the ilium, it continues downward and inward parallel to the twelfth

*Read before the New York Academy of Medicine, Section of Gynecology.

dorsal, pierces the internal oblique about an inch in front of the anterior superior iliac spine and lies about half an inch above the inguinal canal under the aponeurosis of the external oblique, pierces the aponeurosis of the external oblique an inch and a half above the external inguinal ring, becomes cutaneous and supplies the skin above the pubes below the level of the twelfth dorsal. It gives off branches to the transversalis, oblique, and pyramidalis muscles.

The ilio-hypogastric is not usually seen in the Pfannenstiel incision, as it pierces the external oblique above the external ring and is retracted with the lower flap. At times muscular branches to the rectus are found when the lower flap is retracted. All the anterior divisions of the lower dorsal and

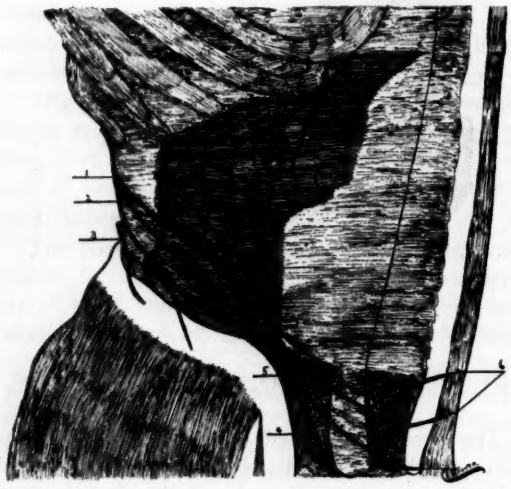

Figure. 2. The anterior divisions of the twelfth dorsal, the hypogastric, and the inguinal branches of the first lumbar. (Adapted from Spatteholz.) (1) 12th dorsal nerve; (2) m. transversus abdominus; (3) ilio-hypogastric nerve; (4) ilio-inguinal nerve; (5) m. obliquus internus; (6) anterior cutaneous branches of 12th dorsal nerve.

first lumbar nerves are double, each nerve supplying a definite section of abdominal wall.

In the Pfannenstiel incision, after the aponeurosis has been separated from the muscle and the linea alba divided and the upper flap retracted, two or sometimes four large nerves can be seen coming up from the recti about an inch from the median line and piercing the anterior fascia. These are the anterior divisions of the twelfth dorsal nerve. They are often half as thick as a match, double, and accompanied by a bloodvessel. They should not be cut, as in retracting the upper flap they can be drawn out sufficiently in nearly all cases. If scissors are used to separate the sheath from the rectus muscle, these nerves may be mistaken for connective tissue and cut. I think this will account for some of the cases of hernia that have been reported as following a Pfannenstiel incision. For years I have demonstrated these nerves to the students at the Polyclinic, and if looked for they are seen in every operation.

The upper part of the anterior division of the twelfth dorsal nerve is not seen and, if care is taken to split the oblique muscles in the direction of their fibers, there is no danger of cutting it even with the extended incision used in large tumors. When a very large opening is required, the incision through the skin can be made from one spine of the ilium to the other. The incision through the aponeurosis is then prolonged over the lateral edge of the rectus muscles and the oblique muscles are split along the line of their fibers, if necessary out to the iliac spine.

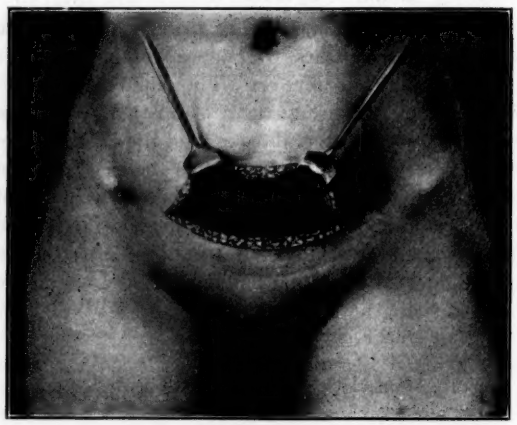

Fig. 3. Shows the incision with the anterior branches of the twelfth dorsal nerves, coming out from the rectus muscle and piercing the aponeurosis covering the muscle.

The detachment of the aponeurosis from the recti can be effected upward as far as the umbilicus and downward as far as the symphysis, the pyramidal muscles remaining upon the flap of the aponeurosis. The recti muscles are separated and the peritoneum severed in the midline.

This provides a very large opening suitable for the removal of the largest tumors and making it easy to operate deep in the pelvis. For a smaller opening, the incision is made in the pubic fold which occurs in all women at all fat. It should be made almost straight with only the slightest curve, not crescent-shaped as it is often described. In young women when a small incision is all that is needed, the skin incision can be made below the line of the pubic hair; the skin and fat are then pushed up and the aponeurosis divided at a higher level. There is no danger to the bladder if the peritoneal incision is started high, and in cutting toward the pubes one knows when he is near the bladder by the thicken-

ing of the tissue and the little bleeding points encountered. It makes little difference in medium-sized incisions whether the pyramidales are left attached to the rectus sheath where they act as tensors of the fascia, or are separated and left on the recti, or whether the peritoneum is entered at the outer side or between them. Hemostasis should be carefully looked after before closing the incision; hematomata are apt to form if this is not done. At the clinic we have used this incision even for large tumors and in infected cases and find that it heals with less danger of hernia than the vertical incision even in the presence of infection.

THE RADICAL OPERATION FOR CERVICAL CARCINOMA.

The exact extent of the growth should be determined before proceeding with the operation. I believe that this is a very important step, for if I had used better judgment at this time and had refused to attempt the impracticable my percentage of cures of those surviving the operation would have been just as great and the primary mortality would have been reduced from seven to two. Five of the seven patients who have died should not have been operated upon. I believe that posterior and lateral extension of the disease which fixes the cervix and cannot be palpated around, hydro-ureter and extensive metastases are contra-indications for operation. The primary mortality is high in this group, and the growth has recurred in all that I operated upon who have survived the operation.

The object of the operation is to free the lower end of the ureters, the bladder and the rectum in order to draw them to one side so that they may not be injured and also to enable the operator to obtain the widest possible excision of the tissues about the cervix. This is the tissue which is first involved, both by direct extension of the disease and also by metastases. The wide excision of the tissues about the uterus above the level of the internal os is of very little importance, for they are rarely involved in an operable (curable) case. The body of the uterus, the tubes and ovaries are also rarely involved. I have never found either the tubes or ovaries involved, and the body only in cases so far advanced that they should not have been operated upon, and that very rarely. The body of the uterus, tubes and ovaries are removed together with the cervix, not because the procedure is of any great curative value but mainly for technical reasons.—JOHN A. SAMPSON in the *N. Y. State Journal of Medicine.*

SOME OF THE USES AND ABUSES OF NORMAL SALINE SOLUTION.

A. DAVID WILLMOTH, A.M., M.D.,
LOUISVILLE, KY.

The effort to supply the blood stream with something to increase its volume, when the volume had been lowered by hemorrhage, represents a very ancient procedure; and that something was blood from another member of the family or of a friend who was sufficiently interested to donate the necessary amount of life-fluid.

As early as 1492 A. D., Pope Innocent VIII was given an intravenous transfusion of blood, the donors being three boys. This effort was, like many subsequently, unsuccessful, and not until the middle of the seventeenth century did transfusion become a recognized surgical procedure.

In 1666, Lower wrote the first detailed account of blood transfusion. Soon afterward, Denys, in France, reported three successful cases. As this work was merely regarded as a curious experiment, after several attempts it was quite deservedly abandoned until the nineteenth century.

Quite naturally, when failure met the efforts of the earlier clinicians they turned their attention to something which would supply the volume, yet easier than blood itself to obtain and administer, and most important of all safer both from a surgical point of view and from the fact that it did not subject the patient to the danger of disease which might exist in the donor. For a while milk and other albuminous fluids were used, but these were soon abandoned. While in isolated cases infusions were performed earlier, not until 1881—when Schwartz methodically described its use—did we possess any reliable data concerning the use of a fluid to take the place of normal blood. This fluid was found to be a 0.9 per cent saline solution, this strength approximately agreeing with the tonicity of the blood—the only property of the blood sufficiently well understood to be imitated at the time the solution was devised.

Since more has been learned of the blood as a whole, including its various constituents, physiologists have vastly improved the original solution by taking into account the other inorganic salts besides sodium chloride. Saline solutions such as those of Ringer, Locke, and others, which have almost entirely replaced the ordinary sodium chloride solutions in physiologic laboratories, conform more closely to the inorganic constitution of the blood; nevertheless, these advances have not to any great extent been utilized in practical medicine. It is a

well-known fact that the addition of potassium and calcium to the saline solution improves it much when used to maintain rhythmical contractions in the isolated heart, and there is little doubt that the efficiency of saline solution would be increased were they more generally employed in everyday medicine.

The addition of colloid material, such as gelatin and gum arabic (the latter in two per cent strength) to increase the viscosity, has not proven of service. However, the addition of dextrose to Ringer's solution has proven of value. Tablets of this combination may be procured from the manufacturing pharmaceutical houses, and the solution will have a specific gravity of 1009.

Since even in the hands of the most proficient, the transfusion of blood carries with it many difficulties and is not free from risk, is it any wonder that the profession should seek some other agent which will meet the demands; and is it any wonder that an agent used so frequently, possessing the virtues it does, should likewise be potent for harm? It is not my purpose to decry the intravenous use of saline solution, but to indicate some of its uses and call attention to the possibilities of doing harm, even producing death, by its indiscriminate employment.

How often have we heard the remark "give him saline solution, it can do him no harm!" This has perhaps been brought about (a) by the knowledge that sodium chloride forms an important part of the body fluids, and that salt is found in liberal quantity in nearly all our foods, where, however, it is changed to the lactate of sodium by the lactic acid thereby setting free hydrochloric acid (Hare: Practical Therapeutics), and (b) by the belief that the kidney glomeruli have no limitation in their capacity to excrete water and the chlorides.

The large field of usefulness for sodium chloride, together with the ease which it can always be produced, so illuminated our therapeutic vision as to blind us to its dangers, and not until some fatalities were reported did we realize that the pendulum had swung too far. Rossle (*Berliner klinische Wochenschrift*, No. 37, September, 1907) called attention to conditions found at autopsy by which he was able to diagnose previous saline infusions. The heart looked cloudy, rather dilated, moist and friable; the blood was thin, the clots watery and yellow in color; the bowel contents were watery; the bladder was found empty, and in some cases ascites was present. Brooks (*Archives of Internal Medicine*, vi, 577, 1910) reported a fatality following the accidental use per rectum of a concentrated stock solution of sodium chloride post-operatively. This was followed in 1911 by Evans, of San Francisco, in an article read in the section of Pharmacology and Therapeutics of the American Medical Association, on the Abuse of Normal Salt Solution, in which he reported several fatalities, and cited liberal quotations from others holding the same views. Geyser, of New York (*American Medicine*, January, 1914), again called our attention to its dangers, which conforms to the remarks made by Hare in *Progressive Medicine*, showing that careful study reveals the fact that we have been just a little lax in watching our results with this popular remedy.

Uses: In surgical practice salt solution attains its highest degree of usefulness in the treatment of hemorrhage, first to replenish the circulating medium, second by refilling the bloodvessels and thereby permitting the mechanical acts of the circulation to proceed. Again, in shock where, by the addition of adrenalin 1-20,000 to 1-10,000, the effects are quickly obtained when the solution is administered by the intravenous method; the heart and bloodvessels are stimulated so that blood which has accumulated in the large abdominal vessels is again put in active circulation. If urinary excretion is small and the kidneys are not diseased, saline solution furnishes a remedy which increases renal activity; the function of the skin is also markedly enhanced. Last, but by no means least, is its use in sepsis. The Fowler position, saline proctoclysis, the use of iodine and saline within the abdomen to convert the peritoneum from an absorbing into a secreting surface, will save many patients whose condition would otherwise be hopeless.

It cannot be said that the action of salt solution has been elaborately studied. It seems well established, however, that while it increases the volume of blood and lessens the specific gravity, it at the same time stimulates the cardiac ganglia and arteries, and accelerates the circulation. The increased arterial tension furnishes more nutrient blood to the heart through the coronary arteries, and in like manner stimulates the nerve centers. All the organs are made to do more work, especially the skin and kidneys where elimination must take place, a point that it is well to remember in its use.

Saline solution may be used in several ways: (a) by injection into a vein (intravenously), (b) by injection into an artery (intra-arterially), (c) by injection beneath the skin into the connective tissue spaces, as under the breast or over the abdomen (hypodermatoclysis), (d) by injection into the rectum and colon (proctoclysis), (e) by leaving a quantity within the abdominal cavity after celiotomy. The late Dr. Dawbarn insisted upon using

it at 110° to 120° F.; this temperature is perfectly safe when we remember that globulin coagulates only at 158° F., and serum albumin at 162° F., and that experimentally 165° F., has been well borne by the dog. The heat acts as a stimulant to both heart and bloodvessels, a point of advantage to the obstetrician in making hot uterine injections for postpartum hemorrhage, and one to be remembered by the general surgeon in his treatment of shock by saline infusion. Under these circumstances there is a sufficient amount of blood to meet the requirements, if it can be kept in circulation. Here, the solution should be used intravenously at a temperature of 120° F. in small quantities often repeated, rather than in one or more rather large amounts, to avoid overwhelming the heart. This is in striking contrast to the amount required in dealing with the results of hemorrhage, where death may occur from an absolute loss of blood, not enough remaining to support the vital functions even though it could be kept in active circulation; death here occurs from interference with the mechanism of circulation, not enough blood remaining in the vessels to enable the heart and elastic arteries to transmit the force of the heart's contractions to distant portions of the body, and as a consequence the blood fails to complete the circuit and all centers suffer from anemia carried to the point of death. Hunter has said this would not occur, even though one-half or two-thirds of the total volume of blood was lost, provided the circulation could be maintained by supplying a fluid in place of the blood. He calls attention to the fact that in certain anemias the number of red cells may be reduced to ten per cent., or even less, of the original number, and yet little distress be noticed in respiration. It must be remembered, however, that such low reductions come about gradually, in contrast to the rapid anemia from hemorrhage.

In the preparation and use of saline solution in any case, and especially in the class just described, much depends upon the strength and composition of the solution and also the technic of its administration. The following facts have been proven relative to the merits and demerits of blood transfusion, and the use of salt solution: (a) that in the first instance the blood cells as such will not last for any length of time in the bloodstream of the recipient, and while transfusion is to be recommended in isolated cases it is far from generally practical and many of the best surgeons do not use it; (b) that saline solution is most useful because it does not destroy the remaining blood, and that the cells are rapidly supplied has been amply proven; on the other hand, plain water extracts the hemoglobin from the red cells and so acts as a poison, distilled water being highly toxic when used in the veins of the dog. This emphasizes the importance of care in preparation; too little salt causes the corpuscles to swell and lose their hemoglobin or they may even be completely destroyed, while too much causes them to shrink. To insure a correct solution tablets should be used, or a stock solution prepared by accurate weight. This stock solution should be sterilized by the fractional method of boiling—for ten minutes each day for two days, then fifteen minutes the third day; this destroys all spores and the method should be employed in hospitals where stock solution of double strength is used; after sterilizing it may be kept in glass containers. In the private home water from the old time tea kettle is sterile enough for practical purposes, also any water that has been boiled for ten or fifteen minutes and then strained. To this add a heaping teaspoonful of salt and four drachms of glucose to the quart, which will be near enough for any purpose save intravenous or intra-arterial use.

The technic of the various procedures which have been described for the introduction of saline solution is comparatively simple, and the necessary apparatus is readily improvised. For rectal use the ordinary fountain syringe may be employed, together with a rectal tube or a long and large catheter; a piece of rubber tubing, a funnel and a pitcher serve the same purpose; or the Davidson syringe may be used. When given by the rectum of course the scrupulous asepsis does not have to be observed, which is essential in the remaining methods to be described; but this feature is common to all, that the maximum stimulation to the circulation and the organism is attained only by a high temperature of the solution, as hot as the hand can bear, viz., 110° to 120° F. When the fluid is employed intraperitoneally, it is introduced at the last moment just before the final stitch is tied to close the peritoneum. For subcutaneous use the apparatus necessary is a good sized hypodermatic or aspirator needle, a piece of rubber tubing, a glass or metal funnel, or a fountain syringe. The fluid is allowed to flow from the needle, which is then plunged through the skin into the connective tissue about the thighs, beneath the breasts, over the abdomen, or about the neck; in fact, almost any convenient locality will answer. Of course, the skin must be made scrupulously clean before being pierced by the needle. An elevation at arm's length ordinarily suffices to make the solution flow into and distend the connective tissue; sometimes an elevation of six or more feet may be necessary.

As the fluid enters the skin pouts out, and when a tumor the size of a small goose egg has formed, it is wise to withdraw the needle and insert it in another place, meanwhile rubbing the tumor with the greased hand to favor speedy absorption. With usual precautions, this method is devoid of danger, and 500 c.c may be easily introduced under each mammary gland.

The intravenous method is sometimes difficult, especially to one inexperienced in general surgical technic. The trouble is that in many cases in which it becomes necessary to employ the intravenous method considerable hemorrhage has occurred, and the veins being collapsed are not easily identified. Usually a vein about the flexor aspect of the elbow is selected as most convenient; a superficial incision is made and the vein dissected free (in preference to introducing the needle through the skin), and a double ligature of small catgut passed beneath it; the vein is now partially severed and the proximal ligature tied. The solution having been previously prepared, is gradually introduced by means of a fountain syringe with the blunt pointed canula, or a large hypodermatic needle; a small-pointed glass medicine dropper will answer the purpose if nothing better is at hand. A sharp pointed needle should never be used, as it is likely to pierce the opposite wall of the vein, even if it primarily enters the lumen. The fluid is permitted to begin to flow, and while doing so the canula is inserted into the vein. This avoids the possibility of air being injected along with the solution, which, although undesirable, is apparently not so dangerous as many writers have assumed. For instance, Hare experimentally injected 40 c.c. of air into the vein of a dog so that it went directly to the heart, and no perceptible impression was made upon the circulation. Ordinarily it suffices to hold the container (preferably of glass) at the height of an arm's length, but it must be borne in mind that it is not desirable to have the saline solution enter the circulation too precipitately. Therefore, the canula should be of small size, preferably a hypodermatic needle; further, the flow may be very well regulated by elevation of the reservoir, i.e., holding it higher with a very small canula. and lower with a larger canula. Bovee states that probably the maximum amount which may be safely introduced into the veins or the subcutaneous cellular tissue is one ounce per minute. By slow introduction most of the alarming symptoms which have been observed to follow the injection of salt solution can be avoided; among these may be mentioned dyspnea, pulmonary edema, headache, vertigo, somnolence (probably from ventricular edema or cerebral hyperemia), mental excitement, delirium, and hallucinations. The more serious factor of overwhelming the heart has already been mentioned.

There remains to be discussed only the intra-arterial method proposed and practiced by Dawbarn in a few cases. Bovee only mentions the method to say it should never be used. Reilly states that "on account of danger of sloughing, the intra-arterial method is seldom used." Dawbarn contended that there was practically no danger of sloughing if the technic he described was used. This technic is as follows: The femoral artery beneath Poupart's ligament is located and fixed between the finger and thumb of the left hand; a hypodermatic needle, preferably of large size, is now pushed through the tissues into the artery. As the lumen of the artery will accommodate a lead pencil, Dawbarn states that it is not easy to miss it. As the needle enters the artery, "a bright red thread of blood wells up." The rubber tubing of a Davidson or fountain syringe is now slipped over the needle with the solution flowing, thus avoiding the introduction of any air; the Davidson syringe is now pumped, or the fountain syringe elevated six feet or more; the small size of the needle prevents the fluid from entering the artery too rapidly. In this way it requires about one-half hour to inject a pint of the solution. In support of the safety of this measure, Dawbarn cites the "needling operation" proposed by McEwen, of Glasgow, for aneurism, and employed with partial success by Wyeth in 1891. The aorta was pierced by thirteen needles, which were left in place twelve hours, and the operation was afterward twice repeated. Dawbarn argues, with some apparent reason, that if thirteen needles can be left in place in the wall of a diseased vessel for twelve hours, there would not seem to be much danger in leaving a single needle for a single hour in the wall of a healthy vessel.

The intra-arterial method is centrifugal, whereby the possible danger of the introduction of air is diminished; on the other hand, the intravenous method has the great advantage of carrying the infused solution directly and quickly to the heart, and so utilizing its heat for the maximum of stimulation to the circulatory organs.

One further use of salt solution is to be mentioned, viz., as an irrigating fluid for general purposes. It is believed to be less irritating than plain water, and, according to Verhoff's experiments, is a most powerful antiseptic because of its power to penetrate the deeper tissues.

In injuries where amputation is necessary the in-

travenous method should be used by injection into the open vein before the ligatures are applied. This method is much easier and, if needs be, quicker than trying to find and open a vein in the arm after the operation has been completed.

Abuses: Under no circumstances should saline solution be used in apoplexy, arterio-sclerosis, pulmonary edema, dilated right heart, threatened sudden death and sudden collapse from chloroform or ether narcosis, the last two conditions requiring more rapid measures. In the light of the present day knowledge, it should not be used in uremia.

In conclusion I desire to state that no more than fifty grains of salt per hundred pounds of body weight is required to kill a dog, and Lazarus Barlow has shown that if too large quantities be used a condition of hydremic plethora may be induced and the specific gravity of the blood reduced from 1064 to 1054. In an attempt upon the part of the kidneys and lymph channels to promptly excrete the excess of fluid, they "overshoot the mark" so that eventually the specific gravity reaches 1067 (Short: Newer Physiology in Surgical and General Practice). If elimination cannot be carried on fast enough, some degree of dropsy may occur, and as the Greenbaums have shown, it takes on the form of edema of the lungs; especially is this likely to occur in nephritic patients. Not more than thirty to forty ounces should be used at any one time, and this should be followed by further injections if need be to prevent reversal of effects.

Caudal Analgesia.

The chief advantages of caudal analgesia are: Extreme safety and absence of unpleasant or dangerous after-effects, as nausea, vomiting, pneumonia, etc. It has enabled us to operate on a class of patients in whom the risk of using general anesthesia would have been too great.

We have been so well impressed with the success of the method during six months' use of it that we believe it is destined to change largely the surgery of the pelvis, especially for the aged, feeble and decrepit. Prostatectomy is at once relieved of one of its greatest objections. The patient goes through the operation without shock, without nausea or vomiting, without menace to heart or lungs, and may be as comfortable after its performance as he has been before it.

The term analgesia as applied to this procedure has been used in preference to anesthesia. In many cases tactile sensation is not completely lost, though pain in the same area is entirely abolished. —Bransford Lewis and Leo Bartels in *The Lancet-Clinic.*

THE FIRST 118 CASES OF OPERATION FOR POSTERIOR DISPLACEMENT OF THE UTERUS.*

(Standardization of the Surgeon.)

G. Paul LaRoque, M.D., F.A.C.S.,
Surgeon to Memorial Hospital,
Richmond, Va.

The classification of displacements of the uterus as anterior, lateral, posterior and downward is quite standard. I have had cases brought to me for operation for anteflexion, but in my personal experience I have found some other condition more satisfactorily accounting for the symptoms and I have, therefore, had no experience with demonstrable anterior flexion of the uterus. Lateral displacements are commonly a result purely of tubal and ovarian disease or pressure from some intraabdominal tumor. The classification of posterior displacements which seems satisfactory to the majority of surgeons the world over and which, therefore, may quite properly be called standard, is as follows:

1. Simple posterior displacement; the fundus backward in the cul-de-sac and the cervix forward occupying the upper and anterior portion of the vagina. 2. Backward and downward displacement with prolapse of the first degree; the fundus in the cul-de-sac; the cervix is visible at the vulva but does not protrude. 3. Backward and downward displacement with prolapse of the second degree; the cervix actually protrudes from the vulva. 4. Backward and downward displacement with prolapse of the third degree; total prolapse in which the fundus of the uterus actually protrudes beyond the vulva office.

Any one of these may be complicated by relaxation or laceration of the vagina with various degrees of rectocele and cystocele.

The diagnosis of displacement of the uterus must be based upon physical examination. In many women in whom displacement is discovered upon examination, there may be no subjective symptoms. The displacement may be intermittent, variable in degree and sometimes due to posture. I have observed a few cases of acute dislocation apparently occurring coincidentally with violent abdominal muscular effort and uterine jactitation in inexperienced young women.

The discovery of posterior position of the uterus during the course of an abdominal operation, when the patient is anesthetized and the abdominal and vaginal muscles relaxed, constitutes no basis for the

*One of a series of papers entitled "Standardization of the Surgeon," read before the Tri-State Medical Society, Richmond Va., February, 1916.

belief that the uterus was displaced before she was anesthetized and the abdominal and pelvic muscles in a state of contraction. I shall not here argue the point nor bring up for debate the question as to whether or not simple posterior displacement of the uterus is of itself pathological and demands operation.

The accompanying table enumerates the various combinations of displacements and other pathological conditions.

In my experience the most frequently associated demonstrable pathology in patients upon whom I have operated for posterior displacement have been inflammation of the cervix and body of the uterus or of the tubes, laceration of the cervix, cystic and prolapsed ovaries and disease of the appendix. Basing the diagnosis of inflammation upon tenderness visible redness of the cervix and visible muco-purulent discharge, I have found this condition in many cases. The patients have suffered pain intensified in comparison to what it was previously and with the flow appearing too soon, lasting too long, preceded and followed by muco-purulent leucorrhea. These are standard diagnostic signs, not of displacement but of inflammation.

In some cases abdominal pain occurring at menstrual periods has been quite properly attributable to the diseased appendix, easily demonstrable at operation. It is the expressed belief of a large number of abdominal surgeons that disease of the appendix is provocative of menstrual pain and that contraction of the uterus may be provocative of pain referable to the appendix. I have repeatedly expressed the belief that inflammation of the cervix and uterus and even of the tubes is frequently caused by the colon bacillus and other organisms gaining entrance from a focus of infection in the appendix, sigmoid and other parts of the bowel, as well as by the bacteria normally present in the vagina; and these probably frequently represent a metastatic implantation from remote foci of inflammation.

At any rate, observation of gross, easily visible inflammation of the cervix in virgins and others in whom clinical and microscopic examination satisfactorily negatized specific infection, has confirmed me in these beliefs.

Concerning the indications for operation I have been guided in the individual case by the standard diagnostic signs. The mere fact that the uterus is displaced constitutes no positive indication for its suspension. Displacement in the presence of inflammation, of lacerations, of prolapse of the ovaries, will not be replaced merely by tamponing, douching and the non-operative remedies employed. So that while the tables show that I have not performed many suspensions without at the same time treating other lesions, I would also emphasize that I have advised suspension in cases in which the uterus was displaced in conjunction with the treatment of the additional lesion present in the case.

Concerning the technic of operation, it is interesting to note that we have more methods and variations of methods than Heinz has varieties of pickles. There are now over a hundred different methods and modifications of methods. The best surgeons in the world have debated as to the best method of suspension of the uterus. Each qualified surgeon has secured satisfactory results. Many surgeons have performed many thousands of suspensions and it is scarcely conceivable that a thousand women would be operated upon by the same surgeon if to that surgeon and to those women the results were not satisfactory.

In the 118 cases that furnish the basis of this communication suspension was performed 117 times; in 30 of the early cases by the Gilliam technic; in some by the so-called Kelly method; in a few I used the temporary suspension of Ochsner and as a part of the treatment for extensive suppurative disease in one case the uterus was held up as a result of shortening the broad ligaments incident to removal of pus tubes; in one, hysterectomy was performed; in 83 cases of this group and all suspensions performed since I learned the method, I have employed the operation devised by Dr. Murat Willis of Richmond and which we have designated the Johnston-Willis technic.[1] This method has given me complete satisfaction. It conforms to the standard principles necessary in performing suspension, it produces no abnormality, and it is what I have called the anatomic method. It is followed by the least pain during convalescence and, above all, the end results, both as to position of the uterus and the relief of symptoms, have been perfect. All the cases have been followed at least three months and most of them examined again. I have had reports from patients and from doctors in many cases after from three to five years. Many of the women have had children since the operation without difficulty. Our patients, too, are perfectly satisfied with the Johnston-Willis technic.

Dilatation of the cervix was performed in all cases not because of actual stenosis (for I have met few cases which seemed to have organic cervical stenosis), but because so many cases needing suspension have also inflammation of the cervix and

(1) Surgery, Gynecology and Obstetrics. June, 1912.

dilatation seemed beneficial in these. Curettage has been necessary in a goodly number of cases. This is not performed routinely, however, but only when there seems to be a gross pathological condition in the uterus. Repair work, either of the cervix or perineum or both, has been necessary in 58 of the 118 cases. Removal of the tube or of an ovary or of an ovarian cyst, in conjunction with suspension, has been recorded in 41 cases. In four cases, myomectomy was performed for subserous fibroids. The appendix has been invariably removed in every case in which the abdomen has been opened to suspend the uterus unless it had been previously removed. Seventy-eight cases showed disease of the appendix.

The additional operations which have to be performed upon patients on whom suspension was indicated, I regard as an important part of the treatment and they are tabulated.

There has been no mortality either from the disease or from the operation.

SUSPENSION OF UTERUS.

Total Cases	117
Suspension, dilatation and curettage	1
" ovarectomy and salping	1
" and append	1
" D and C and append	36
" " ovarect. and append	4
" " " myomect. and append	3
" " salping. ovarect. and append	1
" " " and append	6
" " " and ovarectomy	2
" " " " exc. cyst and closure, faec. fist	1
" " hernia. myomect. and append	1
" " cholecystotomy and append	1
" " salping. and append	1
" " " " and peri	2
" " " " " and susp. kidney	1
" " " " " and overect	1
" " Append. peri. and hernia	2
" " " " and exc. hemorrhoids	1
" " " and perineum	1
" " " " and rep. cystocele	4
" " and trachel	3
" " " rem. ova. cyst	2
" " " " " " " and salpin	2
Suspension, D and C and Append and trachel. rem. ova. cyst and salpin. and exc. hemor	1
Suspension, D and C Trachel	1
" " " and peri	1
" " " " and append	13
" " " " amp. cervix and append.	2
" " " " salping. and append	4
" " " " " ovarec. and append	1
Suspension, D and C Trachel and peri. salping. ovarec exc. hemor. and append	1
Suspension, D and C Trachel and peri. salping. ovarec. susp. kidney and caecum	1
Suspension, D and C Trachel and peri. exc. ova. cyst and div. anus	1
" " " " exec. hemorrhoids	1
" " " " append. lipect. overlapping abd. wall	1
" " " " rep. cysto. append	5
" " " " " " " and lipect.	2
" " " " " " and amp. cervix	3
" " " " " " and amp. cervix susp ovary	1

DISPLACEMENTS OF UTERUS. I.

Total cases	118
Simple backward	66
Back and down (1st deg.) with lac. p	36
" " (2nd deg.) with rect. and cyst	9
Comp. prolapse (fundus protuding) rect. and cyst	7
Disp. uncomp. with addit. patho	4
" comp. with demon. surg. path. of other abd. organs	114
" with inflam.	109
" " ovar. cysts and tumors	26
" " fibroid uterus	
" " lacerations	58

DISPLACEMENTS. II.

Disp. with pelv. perito	1
" " " " and varic. of br. lig. and ulc. bladder	1
" " " " " fib. and diast. recti	1
" " " " " float. kidney	1
" " " " " tuber. tubes, bowel and perito	1
" " " " " faecal fistula	1
" " " " " append. abscess	1
" " " " " append.	7
" " append. and gall stones	1
" " appendicitis	30

DISPLACEMENTS. III.

Disp. with ova. cysts and cyst. ovary	26
" " " " " add. patho	23
" " " " " lac. cervix	3
" " " " " " " and peri	5
" " " " " " " " and append	3
" " " " " " " " " cyst. and append	1
" " " " " " " " float. kid. and caec.	1
" " " " " " " " append.	1
" " " " " " " " " abcess	1
" " " " " " " " " " and faec. fist	1
" " " " " " " " " and hemor.	1
" " " " " doub. uter. and vag. and append	1
" " " " pyelitis and append	1
" " " " Varic. of br. lig. and append	1
" " " " fib. uter. and append	4
" " " " " " " " and ing. hernia	1
" " " " pelv. perit. (non-sup.) lac. per. and hernia	1

DISPLACEMENTS. IV.

Disp. with lac. cer. or peri. or both	58
" " " " and peri	45
" " " " only	7
" " " peri "	6
Disp. with lac. and cystocele	6
" " " " " and vag. ulc	1
" " " " " " hemor	1
" " " " " " append	3
" " " " fib. ut. append. and diast. recti	1
" " " " pelv. perit. and append	4
" " " " " " " and hemor	1
" " " " " " " " float. kid	1
" " " " append	7
" " " " " and gall blad. disease	1
" " " " " " incis. hernia	1
" " " " " " giant colon	1
" " " " " " obesity	3
" " " " pyelit	1
" " " " hemor	1

Tuberculosis of the Kidney.

We are now able to recognize this disease at an early stage, i.e., when only the kidney has been affected, through the use of the cystoscope and ureteral catheter. The cystoscope will tell us whether we are dealing with the kidney or bladder disease as the source of the pus.

In many cases, the bladder changes are not specific of tuberculosis, whereas in others they are so characteristic that one can make a diagnosis from the cystoscopic examination alone, without ureteral catheterization. The latter, aided by pyelography to determine the extent of the destructive changes in the ureter and kidney is of great confirmatory value.

In the case of closed tuberculosis pyonephrosis (where no communication exists to the bladder) the diagnosis by our newer methods is of course impossible and must be made by other means. Ordinary radiography is of but little aid in the diagnosis of tuberculosis of the kidney.

I can highly recommend the Forssell method in examining for tubercle bacilli in the urine. The urine is collected for twenty-four hours and then the sediment centrifuged for two or three hours before being stained.—Daniel N. Eisendrath in *The Chicago Medical Recorder.*

HEMORRHAGE ASSOCIATED WITH PARTIAL AND COMPLETE DETACHMENT OF THE NORMALLY IMPLANTED PLACENTA. CASE REPORTS.

F. L. ADAIR, M.D.,
MINNEAPOLIS, MINN.

Extensive discussions of this important subject have been published. A short article permits of only a brief and concise summary but may bring home to the practitioner some important facts.

Various names have been applied to this condition but we must not permit the nomenclature to obscure the fact that we are dealing with an affection that has two clinical or symptomatic types, one an absolutely concealed and the other a relatively concealed hemorrhage. It occurs quite frequently as a pathologic condition, is associated with premature and still-birth and occurs as a menace to the mother about one half as often as placenta previa, namely about once in five hundred cases.

So far as the etiology is concerned we may recognize two groups, the mechanical and the toxic. In the former would be included those cases resulting from trauma acting externally and those which are due to faulty mechanism acting within the uterus, short cord, etc. In the latter would be grouped those cases which result from degenerative changes in the placenta or decidua produced by some toxic agent. This process may develop rapidly or more slowly depending on the nature of the toxin and the time of its action.

The symptoms to keep in mind are hemorrhage, shock and pain. There may be no visible bleeding and yet the patient suffer from a very acute anemia. The visible hemorrhage may be fresh or old blood, bloody serum, blood-stained amniotic fluid. The shock may be slight or extreme and is produced by the hemorrhage and acute distension which may result in an incomplete rupture of the uterus. The pain is variable and may be absent, it may be localized or general, there may be only labor pains or there may be intense stretching or bursting pains, due to injury of the uterine wall by the accumulation of blood within it. In the examination of the patient one may find the usual signs of hemorrhage and shock. The examination of the abdomen may show a tonic or atonic uterus. It may be very hard. The distension of the uterus may be uniform or there may be an irregularity due to a circumscribed hemorrhage producing the so-called accessory tumor. The fetal heart sound is usually absent and the fetal parts may be palpated with the greatest difficulty.

Mensuration may show rapidly progressive enlargement of the uterus. Vaginal examination may show the blood or bloody fluid, but one of the main points to determine is whether or not the placenta can be palpated in the lower portion of the uterus.

The differential diagnosis should include chiefly placenta previa, uterine rupture, acute hydramnion, syncope and colic of various kinds. The prognosis is not good. The maternal mortality is from 30-50%, and that of the fetus from 85-95%.

The treatment is all important. Early recognition of the condition is essential. The maintenance of extra- and intrauterine pressure both before and after delivery is of the utmost importance. Early, rapid and complete evacuation of the uterus through the parturient canal is advisable, if conditions favor the method, but if not a Cesarean section should be performed, with or without the removal of the uterus.

CASE I. Mrs. A. S. Date, January 22nd, 1908. Age 30. No miscarriages. One premature birth at seven months. Eight full term pregnancies; all labors and puerperia were uneventful. Patient seen at 10:30 A. M. January 22nd. She gave a history of being at term. For a couple of weeks had noticed some blood. Labor pains began at 6:00 P. M. January 21st, 1908. Had more bloody discharge since onset of pains. Fetal movements felt about 8:30 A. M. January 22nd, 1908. Patient complained of constant pain in the abdomen and back with intermittent labor pains. She felt more comfortable. when lying on her back.

Examination showed general condition poor. Anxious expression, pallid. Pulse had risen from 120 at 8:30 A. M. to 134 at 11:30 A. M.; it was irregular, small and rapid. The abdomen was greatly distended, tense and tender. The uterus was very large and firm. The fetal parts could not be palpated and no heart tones could be heard.

Digital examination showed about four cm. dilatation of cervix with partial effacement, membranes unruptured, head movable. No placenta could be felt. There was considerable bloody vaginal discharge.

Treatment— Cervix dilated manually and podalic version done. Still-born male child was delivered. Placenta came away at the same time and was followed by some dark blood clots. There was very little fresh bleeding. Patient was returned to bed in fair condition. About one hour later she became suddenly worse, developed symptoms of pulmonary edema, respiration ceased though heart continued beating for about one half hour.

This case is an instance of the most serious and extreme form of this complication of pregnancy.

CASE II. Seen in consultation October 2nd, 1915. Mrs. M. para 1, age 35 yrs. Due about October 20th. Previously well, Seen by Dr. A. about one week before delivery. She had marked albuminuria. The systolic blood pressure ranged as high as 195.

She developed some edema. She felt well until the afternoon of October 1st, when there was some blurring of vision, dizziness and muscular twitchings. She had not improved under rest in bed and appropriate dietary treatment. She was delivered about 9:00 P. M. on October 2nd without special difficulty. The child was well developed but had apparently been dead for several days. The placenta exhibited a very large clot of blood on its maternal side. It had hollowed out the surface, making a concavity. The patient became worse about one half hour after delivery. She complained of faintness, became slightly cyanotic, almost pulseless, though the respirations were fairly good. There was slight inequality of the pupils. She grew progressively worse and died about one hour later.

This case demonstrates the occurrence of placental separation and hemorrhage in association with acute toxemias.

CASE III. Mrs. E. S. Age about 35. Para V. Grav. VI. Previous health good. Labors uneventful. Onset of labor about one month before term. She had been doing hard physical work during the preceding week and had felt no fetal movements for three days before delivery. She was delivered spontaneously after a labor lasting about ten hours. When the placenta was delivered about one-fifth of the maternal surface near the margin was much darker and more friable than the remainder—this portion of the surface was covered with an old blood clot.

This case illustrates the effect of a partial separation of the placenta on the fetus without disturbing the mother. It was probably due to traumatism.

CASE IV. Miss I. S. Admitted to the hospital in labor October 15th, 1915, at 6 P. M. She was delivered spontaneously of a still-born female at 7:15 P. M. of the same day. She gave a history of a miscarriage five years ago and one labor two years ago. She had some edema of the lower extremities for the past three weeks. Last menstruation May 15th, 1915.

General condition good. There was some edema of the lower extremities. The fetal heart could not be heard. Urinalysis showed the presence of some albumin. The Wassermann reaction was negative.

The placenta was delivered spontaneously and was complete, small, round and showed a dark blood clot on its maternal surface about 5 cm. in diameter. This represents the occurrence of a small concealed hemorrhage without serious effect on the mother but probably the cause of the fetal death.

CASE V. Mrs. S. R. Age 38. Last menstruation April 1st, 1915, though date is uncertain. Time of feeling life first is not known. Patient had some headache and vomiting the first three or four months of pregnancy. There has been some swelling of the legs for the past two months. Patient had one miscarriage two years ago. Three previous labors, first 8½ years ago, last 1½ years ago. Puerperia were uneventful. She had some bloody vaginal discharge for a couple of weeks. Began to have labor pains about 1:00 P. M. November 15th, 1915. She was admitted to the hospital in labor at 11:25 P. M., November 15th, 1915.

Examination showed patient in good condition. No fever. Pulse not accelerated. Some edema of lower extremities. Abdomen was rather tense and hard. Uterine bruit was heard. Fetal heart tones were distinct. There was some bloody vaginal discharge. Placenta could not be felt. The pains were weak, irregular and infrequent during the first stage. In the second stage they were more frequent and stronger though irregular.

She was delivered spontaneously on November 17th, 1915, of a male child 37 cm. long and weighing 1510 gms. The placenta and sac were intact around the child. Following the delivery a considerable amount of old dark blood clots were expelled. For several days following delivery there was marked tenderness over the uterus.

There was a trace of albumin in the urine but no casts. Hemoglobin 70%. Wassermann reaction negative.

The placenta showed no old blood clots. It was small, round, complete and partially membranous.

This case illustrates the danger of confusing placenta praevia with detachment of the placenta. It shows that the placenta may be completely detached and yet produce no serious hemorrhage so far as the mother is concerned, but, of course, be fatal to the fetus.

DIAGNOSIS OF URINARY LESIONS.

The principal reason why so many bladder cases prove annoying to the medical attendant, is to be found in insufficient diagnosis. With a clear diagnosis, direct measures may be instituted and prompt results obtained. Otherwise, we move blindly about our work and our measures are applied in haphazard fashion, to our own discredit and to the patient's disadvantage. The first secret in the differentiation of urinary disorders lies in our ability to make an accurate interpretation of bladder symptoms—or, in other words, not until we become expert cystoscopists do we become proficient in the diagnosis of urinary lesions.—CLARENCE MARTIN in the *N. Y. Medical Journal.*

GOITER SURGERY.

The fact that our results in goiter surgery have been steadily improving during the past few years is due to two factors: first, and most important, a better knowledge of the clinical course of toxic goiters, and of when to select a favorable time for operative interference; and, second, to improvement in technic. There is little doubt that many of the bad results which have followed goiter surgery in the past arose largely from a want of knowledge in the proper selection of cases.—EVERETT O. JONES, in *Northwest Medicine.*

OPERATIVE VS. NON-OPERATIVE TREATMENT OF FRACTURES.

S. C. McCoy, M.D.,
Louisville, Ky.

The present keen and widespread interest in the treatment of fractures of the long bones, as evidenced by papers appearing in medical journals and discussions before medical societies, arises from the fact that in a considerable number of cases the anatomic and functional results obtained from manipulation, fixation and extension have been found more or less satisfactory.

The brilliant pioneer experimental and clinical work of Lane, Lexer, Murphy and others has shown the possibilities of aseptic surgery when applied to injuries of the bones and joints, and osteosynthesis may be said to have acquired a new and live interest. Moreover, the present would seem an opportune time for revision of our views regarding the treatment of this important class of injuries. We have learned much from the application of radiography, and considerable evidence is now available regarding the advantages and disadvantages of the so-called open method of treatment in simple fractures of the long bones.

The open method of treatment is attractive. The results are satisfactory to both the surgeon and the patient. The first and greatest advantage is the power thus gained of accurately replacing the fragments and of insuring their retention in position. The second advantage is the ability to perform early and frequent massage of the muscles and mobilization of the joints, thus anticipating and preventing the muscular atrophy and joint stiffness which might markedly prolong the period of disability.

One clearly established point is that "a good anatomic result is the best guarantee of a good functional result." This is a timely statement. There has recently been a tendency to excuse failure in obtaining a good anatomic result by claiming a good functional result, while admitting that the fragments were not quite correctly replaced; and this doctrine has been used as a shield for the indifferent reduction of broken bones. To a certain extent it is true that a good functional result may be associated with a moderate or bad anatomic result. Much may be accomplished under Wolff's law that "all tissue changes in bone are determined by function alone, i. e., that the normal shape of bone as well as that assumed under pathological conditions is made secondary to the function of the bone. Increase of pressure results in accretion of bony material, and the amount of bone added is proportional to the increase of the burden at any point of the bone." Nevertheless, the ultimate result with imperfectly replaced fragments is usually far from satisfactory.

The pertinent question which naturally arises is: "Can we obtain better anatomic results by the open treatment of fractures than by other methods?" To this question one might reply: "In some cases, yes; in others, no." It would follow, then, that all fractures in which good replacement of the fragments cannot be secured and maintained by manipulation and extension, should be treated by the open method; provided it can be safely used without increasing the period of disability.

Just here arises one of the most important issues in the whole question: It must be conceded that surgical technique sometimes fails, and in considering the open treatment of simple fractures we must recognize that in addition to other possible complications incident to any operation under general anesthesia, there is the danger of infection even when the operation is performed by a hospital surgeon under the most favorable surroundings. The aseptic precautions which appear to answer admirably in abdominal work are inadequate in surgery of the bones and joints. Are we then justified in advising the open treatment and plating of simple fractures? Believing that these accidents are preventable and may be avoided by those properly trained, I would answer "yes, in all instances where in no other way can a satisfactory functional result be obtained; provided the patient is a suitable subject for major operation."

Radiography should be used in all cases to demonstrate the existence of the fracture, the number, position and shape of the fragments and their relation to each other. In some instances it will be immediately apparent that a satisfactory anatomic result by manipulation and extension will be absolutely out of the question; in others there may be revealed evidence of such extensive injury to important vessels or nerve trunks as to demand further examination through an incision; in other cases the radiograph may show merely a transverse fracture giving promise of easy reduction and retention in position. Between these extremes there is a large number of cases (and this group probably includes the majority of all cases) where surgical opinion may differ as to the most suitable method of treatment. In Bardenheuer's clinic they would all (or nearly all) be treated by manipulation and extension, and those of us who have visited Cologne have seen wonderfully good results obtained in

that way. Lane might advise the open operation in all (or nearly all) of them, and many of us can from personal observation testify to the beautiful anatomic results obtained in his clinic at Guy's Hospital.

Personally, I think that as soon as the shape, position and number of the fragments have been determined, an attempt should be made to reduce the fracture and maintain it in position by manipulation, fixation and extension practiced, when possible, under anesthesia; and as soon as convenient additional radiographs should be obtained to display our success or failure. If a good anatomic result has been obtained, then a good functional result may be confidently expected. If anatomic replacement of the fragments has been imperfect, then a good functional result certainly cannot be promised, and there being no contra-indication, treatment by the open operation should be recommended.

I cannot say that I have observed much improvement in the position of the fragments after they have presumably been reduced and extension applied. The full length may be restored and correct alignment secured, and yet the radiograph may show lateral deviation of the fragments; or the upper fragment in a high fracture may be displaced anteriorly, and abducted; or the lower fragment displaced backward.

That it is always desirable to secure perfect replacement of the fragments in a broken bone will probably be conceded by most surgeons; but is it always necessary to immobilize them absolutely with a plate and screws? In the case of fracture of the femur, as a rule a plate is required to prevent change in position of the fragments while the external splints are being applied.

All the fragments should be saved; it is unnecessary that they should have attachment to the soft tissues; they may be completely detached, denuded of all periosteum, temporarily removed and placed in warm saline solution for half an hour or more, and then be replaced. Large and important fragments (six to eight inches long) thus replaced and held in position by Lane plates have united perfectly as shown by repeated radiograms and good functional results. The main essential is asepsis, and, as emphasized by Murphy, raw surface must be placed in contact with raw surface so that the vessels may readily pass from the Haversian canals of the parent bone to those of the autogenous graft. In one case the end of a long and important fragment extended into the knee joint, yet no troublesome callus resulted, and after union flexion and extension were but little less than normal.

I think the question of absolute immobilization of the fragments by a Lane plate after replacement is open to discussion. The important point is correct replacement with retention in position, rather than immobilization; although in fractures of the femur Lane's plates will generally be found more advantageous than other modes of fixation.

In a general way it may be said that when the fragments of a broken bone have been accurately placed in position, there is less tendency to future displacement than has hitherto been believed. In one instance where fracture of both bones of the forearm had occurred, two experienced men failed to replace the fragments under anesthesia. When placed in correct position through an incision, there was no tendency whatsoever to further displacement. In one case of non-union of the shaft of the radius, and in two fractures of the shaft of the humerus, satisfactory results were obtained by inserting a "dowel" taken from the crest of the patient's tibia into the medullary canal of the upper and lower fragments.

The cause of delayed union is sometimes difficult to explain. It may occur following fractures in healthy young adults, where the fragments are in good position. Passive hyperemia and passive motion will oftentimes stimulate repair. In other cases success follows more complete immobilization of the fracture site together with the proximal and distal joints. Passive motion in these cases sometimes acts like a whip applied to a tired horse, "it wakes him up to increased effort." In other cases more perfect immobilization "gets him to his journey's end by giving him time and allowing him to go slowly."

Does union occur more slowly when Lane plates are applied? This is a difficult question to answer. Darrach, Ashhurst, Freeman, Martin, Albee, Murphy, Roberts and Brickner, have expressed the opinion that it does. Many other surgeons, however, hold the opposite opinion. In none of my cases has there been any evidence that plating delayed union. I am certain that plating shortens the period of disability by offering an earlier opportunity to massage the muscles and mobilize the joints.

In conclusion: I wish to express preference for a delay of five or six days before resorting to the open operation. This period allows the soft tissues to partially recover from the associated trauma, and circulation in the blood and lymph vessels to be partially restored, probably largely by the development of collaterals.

BACTERIN THERAPY IN SEMINAL VESICULITIS OF HEMATOGENOUS ORIGIN. A CASE REPORT.

J. L. BENDELL, M.D., F.A.C.S.,
and
L. B. MOUNT, M.D.,
ALBANY, N. Y.

Within a comparatively recent period our attention has been called to the fact that it is not of rare occurrence for the seminal vesicle to harbor microorganisms of hematogenous origin for rather long periods of time.[1]

Neisserian infection of the uretha not infrequently produces a seminal vesiculitis, while tuberculosis of the epididymis may, and often does, extend to prostate and seminal vesicle.

On the other hand, acute infections of hematogenous origin involving primarily prostate and vesicle, non-gonorrheal in nature, are of less frequent occurrence.

In reference to the latter type of lesion, the following case is of interest:

A. R., aged 21, student, born in U. S., complaining of bladder irritability and frequent micturition.

Family history negative. Patient suffered from the usual diseases of childhood. Typhoid fever at the age of 14; rather mild attack with good recovery. For the past four or five years has suffered from hemorrhoids which produce constipation and bleeding at intervals. Beyond this he has been in good health and has not required the services of a physician. There is no history of throat infection, dental caries or venereal disease.

About eight weeks prior to our having seen him the patient reports that he noticed a rash on the abdomen composed of small reddish macules that became confluent, and slowly spread to chest and neck. The latter was unaccompanied by any feeling of malaise nor did it cause any particular local discomfort. A dose of calomel and salts with free purgation seemed to dissipate the rash and the patient thought nothing more of it. Forty-eight hours prior to the onset of the present attack he began to complain of frontal headache, vague joint and muscle pains and general malaise. He also suffered from sensations of chilliness although no definite rigors were present. These symptoms persisted with increasing severity until the early morning of the day upon which the patient was first seen by one of us.

At about 5 A.M. of this day the patient was awakened from sleep with an urgent desire to urinate; and with pain over the bladder area. During the act of micturition he suffered intense pain that became more marked just at the close of urination, the pain radiating from the bladder area down along the head of the penis. The urine was cloudy and a small clot of blood that had been voided attracted the attention of the young man.

From this time on the patient had been forced to void as frequently as each half hour during the day; and the symptoms mentioned above, namely, pain, cloudy blood-stained urine and bladder irritability have persisted.

There is no history of spermatorrhea nor of an erection occurring during this period. There has been one severe paroxysm of pain in the region of the rectum extending downward along the groin.

The history is otherwise negative.

Physical examination. A young adult rather poorly developed and nourished. Temperature 99, pulse 80. Upon rectal examination the right lobe of the prostate is found decidedly hypertrophied, hard and tense to the touch with a smooth even contour. The right seminal vesicle is definitely palpable and decidedly engorged, the latter, in contrast to the prostatic lobe, being somewhat nodular and not so firm in consistence. It gives the impression of being filled with contents of a semi-fluid character and is firmly attached to the prostatic capsule. There is some enlargement of the median prostatic bar, and the left lobe is also slightly hypertrophied although not to a marked degree. The right vesicular-prostatic area is markedly sensitive to the slightest pressure of the finger tip. The examination reveals at once an acute seminal vesiculitis associated with prostatitis on the same side.

Abdominal examination reveals no thickening of either ureter and there is no tenderness in either of the kidney areas or along the course of the ureters. Pressure over the vesical area causes slight pain. The external genitals are normal and there is no evidence of hernial protrusion.

Sterile catheterization shows the urine filled with pus cells, microorganisms, and blood both macro- and microscopically. There is an intense reaction to the guaiac test. Alkalinity and albuminuria are both marked. Numerous spermatozoa are observed under the microscope. A portion of sterile urine injected into a guinea pig causes death of the latter within thirty-six hours from septicemia. Tubercle bacilli are not obtained from the sediment but cultures made from the catheterized specimen obtained under aseptic precautions yield colon bacilli in large quantities.

A diagnosis of vesiculitis of hematogenous origin with secondary cystitis and prostatitis was made and the patient placed upon hexamethylenamine. Injections of a stock colon bacterin were begun. The patient began to respond almost immediately to the bacterin therapy, the urine clearing of pus and blood. Pain and vesical irritability diminished with remarkable rapidity.

Five bacterin injections were given, the initial dose being 17,000,000, and the dosage being gradually raised so that the fifth and final injection consisted of 62,000,000 killed bacteria.

The patient made apparently a complete and uneventful recovery. Three weeks following the initial attack he was again seen by one of us, at which time our notes on the case report the patient

as "feeling fine." He was now voiding without discomfort every three hours. Examination revealed an apparently normal seminal vesicle, although the right prostatic lobe was still slightly enlarged and somewhat sensitive but markedly decreased in size as compared with the initial examination. The urine had changed from alkalinity to slight acidity. Beyond a few epithial cells and amorphous urates it was negative microscopically—no spermatozoa or blood. A second catheterization was performed and the sterile urine injected into a guinea-pig for possible development of tuberculosis, but results along this line were negative.

At the present time the patient is in good health and there has never been a recurrence of his former symptoms.

A fairly careful perusal of the literature of the question of vesiculitis from the standpoint of bacterin therapy does not reveal an abundance of material from which to draw conclusive evidence.

It has been said by one authority that "accurate vaccine therapy is a most valuable aid in the treatment of pus tubes in the male."[2]

Case reports from other sources likewise are favorable as to the efficacy of bacterin therapy in this condition.

"Greatly improved and possibly fully cured" is the conservative but hopeful statement of a report embodying the results of autogenous bacterin prepared from cultures containing mixed growths of Gram—positive diplococci resembling the gonococcus.[3]

Three case reports of gonorrheal vesiculitis treated by means of autogenous vaccines with good results are likewise reported in the literature of 1910.[4]

While we realize that a single case report is of no great scientific value yet the rather unusual clinical features of this case and the somewhat rapid and startling response to bacterin therapy have prompted the present communication.

The experience of other surgeons in this field coupled with our own rather meager observations, which we hope to supplement at some future period, lead us, however, to draw the following conclusions:

(1.) The seminal vesicle is capable of harboring micro-organisms for relatively long periods of time.

(2.) The hematogenous origin of a lesion of the seminal vesicle should not be overlooked.

(3.) Seminal vesiculitis is undoubtedly of more frequent occurrence than is commonly supposed.

(4.) Bacterin therapy is a decided aid in the treatment of the condition, and is worthy of trial in all cases.

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RUPTURE OF AN OVARIAN CYST DURING EXAMINATION.

J. L. BUBIS, M.D.,
CLEVELAND, OHIO.

A very unusual and interesting experience, but one which is very unpleasant and causes much apprehension to the physician is the rupture of an organ during an examination.

Mrs. W., nullipara, aet. 20, married 18 months. Her previous menstrual history was negative. For six weeks prior to my examination she had suffered from severe pains in the lower abdomen, especially to the right, and profuse and almost continuous uterine hemorrhage mixed with blood clots and mucus. She also complained of weakness, constipation, marked anemia and anorexia.

Examination showed a marked anemia from the loss of blood, tenderness and rigidity at McBurney's point. The uterus was slightly enlarged with the fundus forward, but pushed up and to the left by a cystic tumor the size of a lemon, in the right cul-de-sac. There was a considerable discharge of blood and mucus from the cervix. While gently outlining the mass and without causing any pain, the tumor suddenly collapsed and the escaping fluid gave a purring sensation to the fingers. Although I urged the patient to go to a hospital immediately, she walked home, a distance of half a mile.

During the next twelve days she suffered no ill-effects from the accident but consented to enter a hospital on account of the continuous bleeding. Her temperature and pulse were 99° and 110° respectively and the anemia was more marked.

Under ether anesthesia considerable mucous membrane, blood, and mucus were removed from the uterus. A right rectus incision was then made and a thickened, congested appendix containing a fecal concretion was removed.

The right tube was enlarged and inflamed but the ostium was patulous. In the right cul-de-sac there was an enlarged, collapsed ovary lying in a mass of blood clots. On the surface of the ovary was a ragged hole about half an inch in diameter leading into a large irregular hemorrhage cavity of the ovary. The right tube and ovary were removed. The left tube and ovary appeared normal. The uterine hemorrhage stopped the next day. The patient made an uneventful recovery and left the hospital within ten days. Fifteen months later she gave birth to a healthy child.

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WALTER M. BRICKNER, M.D., Editor
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RETROPHARYNGEAL ABSCESS IN INFANTS.

Relatively common in infants and small children is retropharyngeal suppuration—an infection that must always be regarded as serious, not only because of its interference with feeding and, often, with respiration and because of its toll, as a septic process, upon nutrition, but also because, if too long unrecognized or if clumsily handled, it is sometimes fatal. We are referring to the acute retropharyngeal abscess and not to that rarer and even more serious chronic variety that arises from cervical spondylitis.

Why the affection should be so much more common in infants than in older people has not been satisfactorily explained, as far as we know; nor, indeed, is its pathology entirely clear. That it may develop after tonsillitis or pharyngitis is well known, but such abscesses occur even when no antecedent throat affection has been noted. It seems entirely reasonable to continue to believe, however, that the process develops as an infection from the pharynx, naso-pharynx or the ear and that this infection travels through the lymphatics to the retropharyngeal nodes and the tissues surrounding them.

The classical symptoms—dysphagia, regurgitation, dyspnea, altered voice, rigidity of the neck, prostration and fever and, often, visible swelling at the side of the neck, point the way to the diagnosis. But it must be remembered that all the conspicuous signs may be absent in cases in which the abscess is still relatively small; and therefore worth bearing in mind is the importance of a *digital* exploration of the pharynx in all infants and small children suffering with prostration and fever not otherwise accounted for. We say *digital* exploration, for mere inspection may quite fail to reveal the condition, either because it does not bulge sufficiently or because the abscess lies too far down to be seen. In these small throats, even palpation may, at first, not recognize the swelling. Unless large, it is often fairly flat and hard. Only a well developed retropharyngeal abscess feels distinctly fluctuant; more commonly it is merely "elastic." While often situated in the midline the abscess is frequently lateral.

Many surgeons advise that all retropharyngeal abscesses should be opened through the neck. This is, indeed, the more elegant procedure, and it has the important advantage that it quite obviates the danger of pus entering the lungs and the stomach. This is a very important consideration (see editorial, Lung Abscesses Following Tonsillectomy, March issue of THE JOURNAL, page 95). The approach through the neck has, however, the disadvantages that it involves dissection through often healthy tissues, that it leaves a scar, that it requires the services of one surgically facile and familiar with the local anatomy, and, especially, that, although it can be performed under local anesthesia, it usually involves the administration of a general narcotic, which carries a possibility of great danger in these often debilitated children whose respiration is usually already impeded. When there is a fluctuating swelling in the neck drainage through that route is indicated; but the caution must be observed that the primary abscess is thus drained and not merely an associated glandular abscess.

The advantages of opening the abscess through the pharynx are that this can be done immediately that the diagnosis is made, and by any careful practitioner, and that, being but the work of an instant, no anesthetic is required. In order to provide free exit of the pus through the mouth, many advise that the child should be held in the sitting posture with the head thrust forward. It seems to us that, to avoid the inspiration or swallowing of pus, it is better to have the child on its back with the head dependent over the edge of a table and turned to the side. The abscess may, of course, be opened with a bistoury or "guarded" scalpel, but, unless the parts are exposed, the knife may injure other tissues; moreover, the opening made by a scalpel may close prematurely. Better is the employment of a grooved director, and better still, it seems to us, narrow bladed scissors, dressing- or artery-forceps. With only the finger as a guide (mouth gag and

tongue depressor are unnecessary) the closed scissors or forceps are plunged into the center of the abscess, the blades quickly opened and finger and instrument at once withdrawn. Instantly the child is turned on its face, with the head still dependent, and the pus is promptly evacuated.

The procedure requires celerity. The finger and instrument should be but a moment in the small throat, already partly occluded, lest they cause a suffucation which, though transitory and therefore in itself usually not fatal, may produce a commotion on the part of the operator and a struggling on the part of the infant that will result in the inspiration of some, instead of the expulsion of all, of the pus. If this precaution is observed, and if the child is immediately turned face downward and with the head dependent, the pus will escape through the mouth with relatively little danger to the lungs. He would be bold, indeed, however, who asserted that this operation is free from all danger of aspiration into the lower air passages. To minimize this danger it is desirable to hold in the throat during the operation and until it is quite cleared of pus and vomitus a suction tip, as a catheter or rubber tubing, attached to a vacuum apparatus (see editorial above referred to) or to a two-way aspirating syringe or other extemporized device. After the abscess has been safely evacuated, the danger of lung infection is probably remote, for, though pus subsequently escaping into the pharynx is no doubt swallowed by these infants, it does not seem likely that it will find its way into the larynx.—W. M. B.

PROSTATIC CALCULI.

The occurrence of prostatic stones is sufficiently uncommon in the experience of most surgeons to provide much interest in their symptomatology, diagnosis and treatment, the more so since most of the text-books, even those devoted to genito-urinary diseases, give little space to the subject.

The books divide prostatic calculi into two varieties: 1. Those which originate in the prostatic urethra or, more often, passing down from bladder or kidney, find lodgment there. (The latter are not prostatic calculi and should not be so designated.) 2. Those which originate in the gland and may or may not project into the urethra. Thomson Walker describes three varieties: 1. Those originating in bladder or kidney and lodging in the prostatic urethra. 2. Those originating in pouches communicating with the prostatic urethra. (These are apt to project into the urethra.) 3. Those developing in the substance of the gland.

The glandular calculi are generally described as arising from the deposit upon the corpora amylacea of phosphates and of calcium carbonate. While we know that lime formation occurs in dead tissues, and that it is frequently deposited, independent of infection, beneath the subacromial bursa in and about the spinatus tendons, nothing, as far as we know, has been adduced to demonstrate that prostatic calculi may form without an antecedent infection. Irrespective of this consideration it will provide a clearer conception of the pathology of the condition to regard it not merely as one of prostatic calculi but rather as a calculous prostatitis, for, at least in all cases that produce symptoms, the stones provoke an inflammation of the gland even if they have not had their origin in such an inflammation.

The symptomatology of prostatic stones is interesting in its variability and the diagnosis, correspondingly interesting, is usually to be made by a nice balancing of subjective and objective phenomena. The stones may be present for a long time, even indefinitely, without any symptoms and thus found only at autopsy. They may be passed per urethram without previous or subsequent symptoms. They may provoke only perineal pain or discomfort or pain on defecation. They may cause severe pain radiating to the testicles or the thigh or the rectum. They may cause only sticking pain at the end of the penis during or immediately after urination, especially if a calculus projects into the urethra. They may cause hematuria, in distinct attacks or only in small amounts at the end of micturition. They may cause purulent urethral discharge. They may produce all the symptoms of cystitis.

The books tell us that the diagnosis may be made if, on rectal palpation, one feels the stone when it is large enough (but surely it would be difficult to distinguish it thus from a firm adenoma, from tuberculous nodules or from the thickening of a chronic prostatitis), or feels the crepitation of multiple stones, or by the grating against a bladder sound detects a stone projecting into the urinary channel. It might be added that in calculous prostatis the organ is *very* tender to the touch, but this is scarcely diagnostic since the prostate is always quite sensitive when inflamed from any cause and individuals vary in their response to pain.

The books also tell us that prostatic stones cast an *x*-ray shadow, but they do not tell us how to distinguish this from the shadow of a vesical calculus. Prostatic calculi are usually quite small and multiple. If many small, discrete shadows appear with-

in an area that might be bounded by the prostatic capsule, the radiographist will, or should, at once think of their origin within that body. But usually these shadows are not sharp and discrete; they are apt to be conglomerate and to give an image that at once suggests a large round or irregular bladder stone and is thus interpreted by the roentgenographist. He may, however, easily make a differential diagnosis by a method that we have elsewhere suggested. If a radiograph of the *unemptied* bladder, exposed with the patient in the level supine or reversed Trendelenburg position, shows a shadow or group of shadows in the region of the neck of the bladder, and a second radiograph, exposed with the patient in the Trendelenburg position and the *x*-rays passing in the same relative direction, shows the shadow in the same place as before, the stone or stones are fixed in the prostate or the prostatic urethra or in a diverticulum behind the prostate.

There is another diagnostic consideration, not referred to in the books, which also we think worth calling attention to again, namely, that, in a case of purulent prostatitis, the absence, for a long period of time preceding, of all signs of local infection is strongly suggestive of a calculous etiology.

If a stone lies in, or projects into the urethra it will, of course, be attacked by a perineal incision, and for calculi within the gland the perineal route will also be preferable. If the stones are numerous and scattered throughout the gland prostatectomy, more or less complete, may be necessary, a procedure by no means as easy as the enucleation of an adenomatous organ; for its accomplishment the surgeon may elect either the suprapubic or the perineal route, the latter probably offering advantages in such cases unless the organ is large or projects into the bladder. If a prostatic stone mushrooms into the bladder the suprapubic route would seem to be indicated.—W. M. B.

THE WIDER USES OF HYSTEROTOMY.

"In surgical diseases it has been proved by modern surgical methods that the best way to attack a pathological condition or unfold a puzzling symptom-complex is to expose the afflicted parts to the light of day and to the eye of the surgeon." With this characteristic statement of an important fact in medicine, John B. Deaver, eminent exponent of the practical and the direct in surgery, again pleads for a much wider application of the operation of hysterotomy, not only in obstetrics but also as a diagnostic and therapeutic resource in maladies of the now-pregnant uterus. (*Surgery, Gynecology and Obstetrics,* April, 1916.)

One must agree with Deaver that in many obscure cases of uterine disease, and notably those associated with bleeding, the "blind methods of diagnosis" now in vogue—consisting chiefly of palpation and diagnostic curettage—very often leave much, indeed, to be desired; and that free section of the uterus, exposing its wall and its interior to direct inspection and palpation, affords much greater assurance of accurate diagnosis. If theoretical consideration alone leaves any doubt concerning the safety or the value of the procedure, it is resolved by Deaver's statements that he has been performing this operation for years with no mortality and that by it he has revealed and relieved certain obscure conditions which otherwise would have escaped early diagnosis. Among these conditions he mentions malignant changes in the fundus uteri. Deaver recommends two general indications for hysterotomy: 1. As the operation of choice for emptying the pregnant uterus in placenta previa, premature separation of the placenta, eclampsia, prolapse of the cord if the cervix is rigid and the child is still living, and certain cases of pyelitis. 2. To establish a diagnosis in obscure cases, notably those of bleeding in middle-aged women and if malignancy is suspected.

That curettage, employed for diagnosis, will often provide the means of a histologic diagnosis of carcinoma and thus establish the indication for hysterectomy of the unopened uterus is familiar experience; and its value is far too well established to dispute it—whatever may be said against its indiscriminate employment. But when examination of the tissues removed with the curette fails to supply a definite and satisfactory explanation of continued symptoms then exploratory hysterotomy seems a wise and justified operation.

Deaver prefers transperitoneal abdominal hysterotomy to either the suprapubic, extraperitoneal or the vaginal route. As concerns the suprapubic path probably most surgeons will agree with him. For free exposure of the uterine cavity and inspection and palpation of its wall the abdominal route will, again, appear superior to many, although the uterus may be brought down and split to its fundus through the vagina. For emptying a pregnant uterus gynecologists and obstetricians will probably continue to select either the vaginal or the abdominal route according to the duration of the gravidity, the condition of the patient and their individual preferences. Our purpose here is to call attention to the wider indications for hysterotomy, as maintained by Deaver, rather than to discuss the methods of performing it.—W. M. B.

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

STREET ACCIDENTS.

"Safety First," as a slogan, has become popular with many lay organizations and is now seen almost daily in the columns of the press and magazines. The motive of "Safety First" organizations consists of a desire to advise practical measures for the prevention of accidents. While industrial injuries have attracted particular attention, the phases of service involving the reduction of the ordinary hazards of living under urban conditions are not relegated to the background.

The complex state of traffic in large cities is particularly responsible for an unusual proportion of injuries and fatalities. W. P. Beazell, of the *New York World*, during the latter part of 1915, made a survey of the traffic conditions in New York City. As a result of his inquiry, some serious facts developed. The street problems of New York City vary only in degree from those to be found throughout the United States.

Every 22 minutes some one is injured in a street accident in New York City. During the first 11 months of 1915, there were over eighteen thousand accidents and 21,723 persons were injured. The total number of fatalities for this period of time was 612. Two of every five killed were children under 16 years of age.

While homicides are given columns of space in the newspapers principally because of the spetacular features surrounding them, it is only rarely that the injury of some important personage or the attempted rioting of an enraged neighborhood calls for extensive public notice to street accidents. There are, however, two and a half times the number of deaths in street accidents than are occasioned by homicide. What is more suggestive, however, is the regrettable fact that the number of these deaths in New York is greater in proportion to population than is the case in any other great city of America or Europe.

Five years ago street fatalities in New York City were at the rate of 7.98 per hundred thousand population, while in 1915 this rate mounted to 11.65 per hundred thousand population. In other words, the street fatalities have grown 46 per cent. during 5 years.

The tremendous increase in vehicular traffic apparently is responsible in large measure for the development of this injury rate. Thirty-six per cent. of all deaths and injuries in vehicular accidents are the results of automobiles. In responsibility, the passenger automobiles are the most involved, while automobile trucks, despite their power and speed, are responsible for only one per cent. of the killed and four per cent. of the injured.

In the general mind of the public, the vehicle is usually held responsible, but this popular opinion does not take cognizance of the contributory factors inherent in the carelessness or indifference of pedestrians. For example, 1 of every 7 street accidents occurs to a person who is in a street at some other place than at a crosswalk. Children, particularly, are the victims of street accidents while playing, skating or coasting in their most popular playground—the public thoroughfares.

Street accidents reach their highest level coincidentally with the peak of pedestrian travel between 5 and 6 in the afternoon. Possibly physical and mental fatigue, incident to the day's occupation, decrease the alertness of the pedestrian and thus makes him less attentive to his own safety.

While power-driven vehicles are pre-eminently responsible for the injuries, it cannot be gainsaid that the lack of playground facilities for children, which is a municipal responsibility, is a most important and a pathetic contributory factor. More than half of the lives sacrificed in automobile accidents have been those of children under 16 years of age, while the ages of 3 to 8 years inclusive apparently are those of greatest danger to children.

Under these circumstances, it is patent that the solution of the problem of accidents growing out of traffic is complicated. Various administrative regulations should be made with a view to controlling traffic, particularly in crowded thoroughfares. More precautions are essential in restricting the speed of vehicles in localities where children are most numerous, especially during the hours when the adult population adds to the sidewalk congestion. The establishment of play streets, backyard and roof playgrounds and the extension of the park system immediately suggest themselves as "Safety First" devices for decreasing street accidents among children.

In addition, it is obvious that a wholesale educational campaign is necessary to point out the dangers of the streets, to encourage street crossing only at crosswalks, and to point out the inherent hazards of playing in the streets.

Departments of Education have made some attempts to give educational force to the "Safety First" campaign. In so far as education is designed to make good citizens, there is a valuable service which it can perform in giving adequate instruction to children as to the best methods of preserving life and limb. In many schools, it is already the custom to delegate to the older pupils the specific duty of seeing that groups of the younger children are safeguarded while crossing busy streets adjacent to the schools. These efforts supplement the excellent work now performed by traffic policemen in holding up traffic at crosswalks in front of schools during the hours that children are going to or leaving the school houses. The 7,126 children under 16 years of age who were injured during the 11 months supply sufficient reason for giving particular attention to this phase of the problem.

The faults of drivers may be summed up as speeding, driving on the wrong side of the street, turning corners improperly, backing without notice, violating the 8 foot law, travelling without lights, intoxication and carelessness. Summary punishments for accidents due to these causes might serve to mitigate their frequency. Defects of vehicles themselves may be responsible for many of the acci-

dents, but they represent a negligible proportion of the total.

The faults or incapacities of the injured persons indicate the general subjects concerning which education must be given. These involve stealing rides, improperly boarding or alighting, running in front of vehicles, walking, standing or sitting in the streets and on the curbs, crossing streets at points other than crossings, general playing in the street, riding or coasting on the wrong side of the street or in dangerous parts of the street, and personal defects such as blindness, deafness or a crippled condition. Carelessness naturally forms an important item.

Inasmuch as the study of traffic conditions reveals the fact that the accidents growing therefrom are largely preventable, it is unfortunate that widespread efforts have not been made to decrease their number and severity.

Book Reviews

Cancer of the Stomach. A Clinical Study of 921 Operatively and Pathologically Demonstrated Cases. By FRANK SMITHIES, M.D., Gastro-enterologist to Augustana Hospital, Chicago. With a chapter on the Surgical Treatment of Gastric Cancer, by ALBERT J. OCHSNER, M.D., Professor of Clinical Surgery in the University of Illinois. Octavo; 522 pages; 106 illustrations. Philadelphia and London: W. B. SAUNDERS COMPANY, 1916. Cloth, $5.50, net; half morocco, $7.00, net.

This work is of monumental character, based upon a most careful and critical review of 921 cases of carcinoma of the stomach, cases collected by Smithies during a wide and varied experience of ten years as a member of the staffs of the University Hospital (Ann Arbor, Michigan), the Mayo Clinic, the Augustana Hospital (Chicago), and the University of Illinois. Only a very close and careful reading of this most valuable volume will give the reader an appreciation of the full worth of the contained facts; no detail has escaped the authors' closest scrutiny, no possible point on which the inquirer will fail to obtain exact figures as to incidence of occurrence, value of a laboratory test, method of procedure, etc. The monograph, in its completeness, rivals even its exactness.

The book has been written from the viewpoint of one who accepts the conclusions of McCarthy and Wilson in regard to the frequent degeneration of chronic ulcers of the stomach into carcinomata. As is generally well known, these authors have formulated the theory that a large proportion of gastric cancers develop on an ulcer basis, substantiating their contention by most exact histologic study of excised chronic ulcers and tumors. In their experience, 71 per cent. of undoubted gastric carcinomata presented clinical or microscopic evidence of previous ulcers. In their view cancer is malignant hyperplasia.

Needless to say, their contention is not accepted generally without exceptions, for the question debated is always, "What is malignant hyperplasia and what is benign hyperplasia?" Where does the simple adenomatous hyperplasia which accompanies every chronic and healing ulcer become a malignant process? Those who do not categorically accept the view of McCarthy and Wilson and of Smithies will feel, in reading this volume, that in this series of 921 cases there are some that in their own laboratories they would call very questionable, or even simple benign callous ulcers.

All of the figures and percentages quoted in this work are necessarily colored by this viewpoint, since the largest proportion of the cases in this series are not, as was the older view, cases that without previous gastric history complained of failing appetite and weight, vomiting, hematemesis and a growing mass, but are cases of chronic callous ulcer of the stomach, which upon excision and examination showed areas of beginning or advanced malignant hyperplasia. In fact McCarthy and Wilson claim that two-thirds of excised callous ulcers show malignant metamorphosis.

Keeping this newer viewpoint in mind, it will be of interest to review a few of the more prominent facts in the text.

Carcinoma of the stomach is divided into the following symptom-complex headings:

GROUP 1—Gastric cancer in patients who came to laporotomy for clinically benign gastric ulcer and in whom cancer was microscopically diagnosed. This group comprises 7.8 per cent. of the cases.

GROUP 2—Gastric cancer, developing clinically in patients with years of antecedent dyspepsia of the peptic ulcer type. This group comprises 47.3 per cent. of the cases. Of these 89 per cent. show vomiting, 74 per cent. of daily occurrence.

GROUP 3—Gastric cancer in individuals who prior to the onset of a malignant disease had enjoyed good health. In the words of the author, "This group satisfies the popular conception of what constitutes gastric cancer clinically."

Thirty-one per cent. of 921 cases belong in this class. Occult hemorrhage is present in 86 per cent. of these cases. Rise of temperature was not unusual.

GROUP 4—Gastric cancer in individuals in whom malignancy followed periods of gastric disturbances of irregular clinical type (9.12 per cent. of the cases).

GROUP 5—Gastric cancer in individuals who presented few clinical evidences of a malignant process primary in the stomach wall (2.1 per cent.)

GROUP 6—Gastric cancer secondary to extragastric malignant process (1.7 per cent.).

Thus we note that groups 1 and 2 comprising the cases of cancer on an ulcer basis make up 55.1 per cent. of all the cases.

Smithies lays particular emphasis on thorough preparation of the patient before examination. He credits this careful preliminary lavage, catharsis and enemata with many of the so-called clever diagnoses possible. A hot bath of 15 to 30 minutes' duration at a temperature of 37½° C. is strongly recommended as an adjuvant to examination.

With the assistance of these measures, a tumor or abdominal mass was palpable in 66.7 per cent. of the cases. Changes of position in the patient and inflation of the stomach and the colon assist both in bringing out tumors and in localizing the organ to which they belong. In 16 per cent. of the cases pelvic metastases were palpable by rectum, forming the so-called "Bloomer's shelf."

The author lays great stress on the importance of obtaining accurate chemical data in all cases suspected of new growth. More important still is the proper interpretation of such data when obtained. He decries the recent tendency to belittle chemical means of establishing a diagnosis, a tendency which is only too rife in these days. The chapter on test meals, examination of fasting stomach contents, motor meals, etc., is admirably handled, the methods discussed in detail and their interpretation amply considered. As an example, Smithies found lactic acid present in 66.1 per cent. of his cases; in 95 per cent. of the cases in which lactic acid was found the tumor was already inoperable. A new method of agar-agar fixation of gastric residues is well described and deserves further consideration. In 221 consecutive cases Boas-Oppler bacilli were demonstrated in 93.6 per cent. Most interesting studies on the cultural and morphological characteristics of the bacilli are given in much detail, many of the methods used being quite original. The Gluzinski test, Edestin test, glycyltryptophan and tryptophan tests, formol index, and Wolff-Junghans test receive much attention from the author; he not only refers liberally to the literature, but gives his own unbiased opinion and experience with them.

The chapter on Roentgen examinations is thoroughly considered, though it is soon evident that the author does not rely extensively on this method of procedure for an early diagnosis. He believes that in most of the cases the clinical history and the stomach tube will establish the cause of the symptoms more cheaply and sooner than the *x*-ray. He values this latter instrument more for its ability to localize tumors and for the psychic effect on the patient. Admirable photographs of radiographic plates of tumors of the stomach are liberally supplied.

Under the chapter of blood examinations in gastric tumors, the author describes some of the less well recognized and less familiar tests of the disease. The hemolytic reaction, the cancer skin test, the cancer reaction of Freund and Kaminer, the antitrypsin reaction, Abderhalden, myostygmin reaction, etc., are all considered, though the author draws his own conclusion that though they may all help in a minor degree in establishing a diagnosis, they are involved and complicated methods, and their conclusions when obtained are indecisive.

In a chapter devoted to gastric cancer in the young, Smithies demonstrated that 86 per cent. of his cases satisfied our present day clinical complex of peptic ulcer at some time during a period averaging 4.8 years previous to the onset of symptoms of malignancy.

The second part of this book, dealing with the surgical treatment of gastric cancer, is written by Ochsner. It is well written, lucid, terse, and yet highly practical in its method of dealing with the subject. His own methods of gastrostomy, excision and gastro-enterostomy are described in detail and well illustrated. The use of catgut throughout, for all sutures except those coapting serosa only, is worthy of mention. One of the most important points considered is the after-treatment of the operated case, a point only too often forgotten both by practicing surgeons and by those who write treatises. Ochsner insists upon nothing but water and the simplest of fluids for the first week; after this buttermilk, and cream and egg-albumin are allowed. He considers it inadvisable to give solid food before the sixth week.

Ochsner further claims that by systematic lavage of the stomach, both before and directly after the operation, by permitting the patient to awaken thoroughly before the last stitches are put in place and by great care with the anesthesia, that he has almost completely eliminated post-operative pneumonia.

We note with regret the absence of a chapter on prognosis and duration of life after excision of gastric tumors. It would be most interesting to know the effect of longevity of the patient of these newer methods and observations facilitating the early diagnosis of the condition. This is the one essential point lacking in this monograph.

The book is one of the most valuable of its kind written, thoroughly modern, exacting in its detailed consideration of all phases of the subject, and most noteworthy because of the recent viewpoint of the authors in their consideration of the frequent causal relationship of gastric ulcer and gastric cancer.

Bone-Graft Surgery. By Fred H. Albee, A.B., M.D., F.A.C.S., Professor of Orthopedic Surgery at the New York Post-Graduate Medical School and the University of Vermont, etc., etc. Octavo; 417 pages; 332 illustrations (3 in color). Philadelphia and New York: W. B. Saunders Co., 1915.

It is of course true, as has been said, that Albee did not invent the bone graft and that he was not the first to use an inlay or a sliding graft. But it is equally true that he vastly broadened the field of the bone graft, evolved its indications, demonstrated its wide usefulness, and elaborated very nice, indeed elegant, technics and instruments for its employment. It is altogether proper, therefore, that inlay bone grafting should be intimately associated, as it is, with Albee's name; and certainly the credit is chiefly his for firmly establishing inlay and peg-bone grafting as an extremely important physiological and therefore surgical method in dealing with many of the diseases, deformities and injuries of the skeleton. His own work, therefore, describing his methods first hand will be, indeed already has been, welcomed by the surgical profession of all lands.

This monograph is neither large nor unduly technical. It describes the author's methods clearly and simply and without unnecessary discussion or elaboration. It can be read through without effort or fatigue, and it leaves in the reader's mind no uncertainties concerning mechanical details. It is, moreover, freely illustrated with drawings, radiograms and photographs that demonstrate each step of the operations and their results.

The work is based on an experience in over 400 human cases and much animal experimentation, in which Albee developed his "cabinet maker" mortising and dowelling methods and his motor and its attachments for giving these methods precision.

The first chapter deals with the fundamental principles underlying the use of the above graft in surgery. It covers all the essentials and is terse and to the point, selecting the prominent facts in the history of bone graft studies. It also summarizes indications and contra-indications. One might regret that the author did not enter more fully into histological and his own experimental data; but after all, these might well constitute a monograph in themselves.

The second chapter describes the author's electric motor outfit and its use.

The remaining chapters describe the application of the bone graft in Pott's disease, fractures, congenital and inflammatory bone defects, for joint fixation in infantile paralysis, osteoarthropathy, habitual dislocation of the patella, diseases and deformities of the foot and leg, for remodelling or ankylosing the hip joint, etc., practically all his own operations in methods, and most of them also original in conception.

There is an index of authors referred to, but no bibliography. We venture to suggest to the author, for the preparation of his second edition, more care in proof-reading and a little polishing up of his rhetoric.

Autoplastic Bone Surgery. By Charles Davison, M.D., F.A.C.S., Professor of Surgery and Clinical Surgery, University of Illinois College of Medicine, etc., etc., and Franklin D. Smith, M.D., Clinical Pathologist to University Hospital (Chicago). Octavo: 369 pages; 174 illustrations. Philadelphia and New York: Lea & Febiger, 1916.

The present lively interest in the operative treatment of fractures and in bone grafting makes this admirable little work timely indeed. But it is far more than merely timely; it is extremely interesting, suggestive and informative.

The book might be divided into two parts. The first consists of three chapters, which we presume were written by Smith, dealing with the growth and regeneration of bone and the behavior of transplanted bone. It reviews the theories and observations of various investigators and presents many interesting histopathological data based on the author's experiments. As a review and analysis of the subject it is one of the best and quite the most interesting we have read. It displays on the part of its author (or authors?) an admirable scientific spirit and excellent critique. It is a great pity that the writer of such a splendid presentation did not have his manuscript edited by someone who had better command of English construction and more respect for English grammar.

The second, larger, part of the book, probably written by Davison, and also excellent, deals with the surgical or mechanical side of the subject. The fourth chapter summarizes the indications for autoplastic bone surgery. The fifth chapter describes various instruments required, including different types of electric motor driven saws, bone clamps, the Hawley table, etc., and the general technic of bone transplantation. The remaining chapters deal with the autoplastic repair for fixation in fractures (old and recent), Pott's disease (Hibbs', Albee's and Don's operations), various congenital and acquired bone defects and deformities of the head, spine and extremities, and a few miscellaneous conditions. These chapters are embellished with interesting case reports and splendid pictures. The excellence of the photographs and radiograms, the clearness of the type, and the very thorough bibliography

enhance the usefulness and attractiveness of a work which, textually, is of great value.

The Roentgen Diagnosis of Surgical Lesions of the Gastro-Intestinal Tract. By ARIAL W. GEORGE, M.D., Assistant Professor of the Department of Roentgenology, Tufts College Medical School; Consulting Roentgenologist to the Carney Hospital, Boston Dispensary and the Forsyth Dental Infirmary, etc.; and RALPH D. LEONARD, A.B., M.D., Assistant in the Roentgen Department of the Boston City Hospital; Instructor in Roentgenology at Tufts College Medical School. Octavo; 306 pages; seven three-color illustrations, eighteen artists' drawings, and 343 Roentgen plate reproductions. Boston: THE COLONIAL MEDICAL PRESS, 1915. Price, cloth, $10.00 net.

Books dealing with the Roentgen diagnosis of gastro-intestinal lesions are not numerous. To place before the reader pictorial evidence of gastrointestinal disorders, rather than explanatory text matter, is sensible, instructive and more or less novel. In doing this, George and Leonard have broadened the field of usefulness for their book, because it thus becomes a valuable asset to almost any medical man.

There is, however, one feature which has been omitted in this book, one which would make it of much greater value to every physician and Roentgenologist as well—namely, the omission of the cases in which the Roentgen diagnosis was wrong. It seems to us that we profit by failures most. If the authors are followers of the direct method school, it is but fair to expect that all their diagnoses were made upon such evidence. It would be very interesting to note upon what evidence the diagnosis was made in cases which proved negative.

The arrangement of the contents in sections is well carried out. The reproductions of the plates are excellent, and the textual description concise and to the point. A careful study of this book by every one interested in gastrointestinal diseases will materially enlarge the scope of Roentgenology and dispel some of the skepticism which still prevails among some members of the profession.

We recommend this book to our readers.

Obstetrics. A Practical Text-Book for Students and Practitioners. By EDWIN BRADFORD CRAGIN, A.B., A.M. (HON.), M.D., F.A.C.S., Professor of Obstetrics and Gynecology, College of Physicians and Surgeons, Columbia University. Assisted by GEORGE H. RYDER, A.B., M.D., Instructor in Gynecology, College of Physicians and Surgeons, Columbia University. Large octavo; 859 pages; 499 engravings and 13 plates. Philadelphia and New York: LEA & FEBIGER, 1916.

While in no sense representing any important departure from or improvement on the other American text-books on obstetrics or offering any decided advances in the art of obstetrics, this book is nevertheless welcome in that it reflects the methods in vogue at the Sloane Hospital for Women and that it presents the valuable statistics of that hospital.

The author frankly states that he has made no effort to present a complete bibliography. He has sacrificed much for conciseness. It is obvious that by omitting what is still subject to dispute he has avoided confusion in the minds of the student. On the other hand, it is important to call attention to these gaps in our knowledge, and certainly there are enough of them, even in obstetrics, the oldest, perhaps, of the branches of medical art. The chief items of obstetric interest are however presented in an essentially practical way. Whatever be the viewpoint the student may arrive at through the medium of this book, the latter will be of definite value to practitioners and even specialists in obstetrics as a record of the experience and results of the head of a large metropolitan obstetric service.

Considered, however, as a scientific treatise based on such a vast experience under the most favorable opportunities for observations and investigations, this work falls far short of its possibilities.

Progressive Medicine. Edited by H. A. HARE, Professor of Therapeutics, Materia Medica and Diagnosis in the Jefferson Medical College, Philadelphia; assisted by L. F. APPLEMAN, Instructor in Therapeutics, Jefferson Medical College, Philadelphia. March 11, 1916. Philadelphia and New York: LEA AND FEBIGER.

The number contains the following reviews: Surgery of the Head and Neck by Chas. H. Frazier; Surgery of the Thorax, excluding diseases of the breast, by G. P. Müller; Infectious Diseases, including acute rheumatism, croupous pneumonia and influenza, by John Rühran; Diseases of Children, by F. M. Crandall; Rhinology and Laryngology, by G. B. Wood; and Otology, by T. L. Saunders. All these reviews are excellent.

The Practitioner's Medical Dictionary: Containing all the Words and Phrases Generally Used in Medicine and the Allied Sciences, with Their Proper Pronunciation, Derivation, and Definition. By GEORGE M. GOULD, A.M., M.D., author of "An Illustrated Dictionary of Medicine, Biology, and Allied Sciences," etc. *Third Edition.* Revised and enlarged by R. J. E. SCOTT, M.A., B.C.L., M.D., Editor of Hughes' "Practice of Medicine," etc. Octavo; 962 pages; illustrated; flexible cover. Philadelphia: P. BLAKISTON'S SON & COMPANY, 1916. Price, Cloth, $2.75.

This new edition of Gould's Medical Dictionary combines with practical completeness the qualities of convenient size, light weight and moderate price. The type is clear and readable, though not large. In the book of 8¾x6¼x1¼ inches are defined over 70,000 terms, including those that have recently entered the nomenclature of medical science.

A Practical Treatise on Infant Feeding and Allied Topics, for physicians and students. By HARRY LOWENBURG, A.M., M.D., Assistant Professor of Pediatrics, Medico-Chirurgical College of Philadelphia; Pediatrist to the Mt. Sinai Hospital; Pediatrist to the Jewish Hospital, Philadelphia, etc. Octavo; 382 pages; illustrated with 64 text engravings and 30 original full-page plates, 11 of which are in colors. Philadelphia: F. A. DAVIS COMPANY, 1916. $3.00.

The author describes most of the recognized methods of infant feeding and gives a critical review, based upon personal experiences of each. The exposition is clear and systematic and written in didactic style. The text is unencumbered by references. The latter half of the book discusses various infant maladies in which infant feeding is a large factor, such as: atrophy, rachitis, scurvy, vomiting, constipation, diarrhea, etc. We have found the book very useful.

Books Received

Diet for Children. A Complete System of Nursery Diet with Numerous Recipes; also many Menus for Young and Old School Children. A Home and School Guide for Mothers, Nurses, Teachers and Physicians. By LOUISE E. (MRS. JOHN L.) HOGAN, author of "How to Feed Children," "A Study of A Child," "U. S. Government Bulletin No. 56," etc., etc. Duodecimo; 160 pages. Indianapolis: BOBBS-MERRILL COMPANY, 1916.

Handbook of Massage for Beginners. By L. L. DESPARD, Member and Examiner, Incorporated Society of Trained Masseuses. Duodecimo; 247 pages; illustrated. London: HENRY FROWDE, OXFORD UNIVERSITY PRESS, 1915. Price, $2.00.

Report of the Committee on Fractures of the American Surgical Association for 1915. W. L. ESTES, M.D., Chairman, South Bethlehem, Pa. Reprinted from the Transactions of the American Surgical Association, 1915.

Instinct and Intelligence. By N. C. MACNAMARA, F.R.C.S. Duodecimo; 216 pages. London: HENRY FROWDE and HADDER AND STOUGHTON, 1915. $2.00.

Progress in Surgery

A Résumé of Recent Literature.

The Postoperative Management of Pyloric Stenosis. EDWARD A. MORGAN, M.D., New York. *American Journal of Diseases of Children,* April, 1916.

This study is based on the personal observation of fifty cases operated on at the Babies Hospital.

Preparation: Maintenance of the body temperature is of paramount importance. The infant's extremities should be swathed in cotton before and during the operation. The temperature of the operating room should be between 75° and 80°. A hot pad should be placed beneath the baby. Just before operation gastric lavage should be performed. Colon irrigation is unnecessary. Both stimulants and hypodermoclysis should be withheld before operation if possible.

Postoperative Measures: Body heat must be maintained. For the first hour or two the head of the bed should be lowered to prevent aspiration of mucus into the larynx. Hypodermoclysis of normal saline or glucose solution is always indicated (120-240 c.c.). Epinephrin is useful. Transfusion's value is doubtful. A postoperative temperature rise is usual, gastro-enterostomy being followed by higher fever than the Rammstedt or plastic operation. Pyrexia that persists for more than three days should be investigated, as it usually means some complication.

The aim should be to start nourishment as soon as possible after operation. Breast milk should be procured if in any way possible, especially for the first week. The routine now followed after the plastic operation is to begin feeding one hour after operation. First 16 c.c. of water are given, and one hour later 12 c.c. breast milk diluted with 4 c.c. water. This is increased up to 16-24 c.c. undiluted breast milk q. 3 h. at the end of 24 hours; 20-30 c.c. at 48 hours and 30-45 c.c. at 72 hours. Water must also be given.

Vomiting frequently occurs and is most commonly due to distention from gas accumulation. Elevating the head of the bed may be of considerable use.

As a rule there is no stool for the first twenty-four hours after the operation, and at this time a teaspoonful of castor oil should be administered. Not infrequently a diarrhea occurs in those children who have had a gastro-enterostomy done. This may be difficult to control and is one of the most serious objections to this type of operation.

The prognosis depends on the duration of the disease, the preoperative condition of the child, the nature of the operation, and the experience of the surgeon. Of 50 cases here reviewed, fourteen died, a mortality of 28 per cent. Fifty per cent. of the deaths occurred in the first thirty-six hours after operation, so that, until the infant has passed through this danger period, the prognosis should be very guarded. After five days of uneventful progress the parents may be reassured as to the ultimate outcome.

The Normal Stomach: Its Size, Position, Form, Tone, Peristalsis and Mobility From a Radiographic Standpoint. C. WINFIELD PERKINS, M.D., New York. *The Medical Press and Circular,* March 22, 1916.

Peristalsis does not seem to exert any influence on the tone of the stomach, for we may have exaggerated peristalsis with a hypotonic stomach and diminished peristalsis in a hypertonic stomach.

There are no determined fixed points of any type of stomach in the abdominal cavity, except the cardiac portion.

A stomach may be of any of the types and yet be normal from an *x*-ray standpoint.

The average normal stomach is orthotonic. The usual position of the orthotonic stomach is as follows: Greater curvature (lowest point) one to two inches above the interspinous line, either median or to the left; lesser curvature (lowest point) three to four inches above the same line, median or one to two inches to the right.

The pylorus is placed two or three inches above the line, in the median position, or one and a half inch to the right.

The axis of the stomach is vertical and parallel to the median line.

The length is eight to ten inches and the width three to three and a half inches.

The tendency of the male stomach is always toward hypertonicity, while that of the female is toward hypotonicity.

The stomach is not, as a rule, as high in the abdominal cavity as many text-books of anatomy teach. There is no structure in the human body, however, that has such variations in form, tone, and position.

The radiographic examination, either by the fluorescent screen or plate, is the only accurate method of ascertaining the anatomical position, form, peristalsis, and mobility of the stomach. Therefore, revolving in mind that the type of stomach fits the patient, a chart of the relative positions of the stomach should be of service to the clinical diagnostician in locating pathological lesions of the organ; that is, if he has not *x*-ray methods at hand. Such a chart should also be of service to the radiological technician in locating points for radiographic work.

Appendectomy Under Local Anesthesia. J. WIENER, New York. *Journal of the American Medical Association,* April 8, 1916.

Wiener says that in the last eleven months he has operated on fifteen cases of appendicitis under local anesthesia with very satisfactory results to himself and his patients. To anticipate objections he says the first will be the difficulty in dealing with adhesions. Fibrous adhesions are not sensitive and can be easily divided. The omental adhesions can be readily anesthetized by injecting a few drops of the local anesthetic. A few of his cases have been acute, but he hopes to use the method in more of this class of cases, even in the presence of a peritonitis. In the cases in which he has operated under local anesthesia there has been very little or no tympanites, and peristalsis has been little or not at all inhibited. In a recent case, gas began to be passed fifteen hours after operation. Abdominal discomfort, nausea and tympanites were absent. Half an hour before operation he gives a hypodermic of a quarter-grain of morphin. He usually uses a 1 per cent. solution of novocain to an ounce of which twenty drops of a 1:1,000 solution of epinephrin are added. As much as 240 minims of this can be safely used for an adult, but as a matter of fact he has never had to use as much for a painless appendectomy. He prefers the muscle splitting McBurney incision, which lends itself well to the local anesthesia operation. The solution is first injected into the skin along the lines of the cut and followed up by deeper injections along the same lines. The skin and subcutaneous tissues are painlessly incised down to the aponeurosis of the external oblique with a sharp scalpel rather than with scissors. The novocain is then injected under the external oblique aponeurosis, and after two minutes this is divided. It is next injected into the internal oblique, and after another wait of a few minutes this is incised. Then a little novocain is injected under the peritoneum and it is divided in three minutes more. The manipulation should be as gentle as possible. As soon as the cecum with the appendix is exposed some novocain is injected into the mesenteriolum to prevent cramplike abdominal pains. After a wait of three minutes the appendix can be pulled out of the abdomen, the mesentery ligated and divided, and the appendix removed with almost no pain. He has kept a record of the statements of the patients concerning their feelings and they have stated that whatever pain they felt was much less than they expected. A few hours after operation there may be a little wound pain readily controlled by codein or morphin. Peristalsis is early and almost all of the patients have been able to take and retain fluids within a few hours. The postoperative depression common after ether is entirely absent. The patients are usually able to get out of bed on the fourth day and to leave the hospital on the seventh or ninth day. An ordinary uncomplicated operation can be performed in from twenty to thirty minutes, much of the time being used in waiting for the anesthetic

to act on each layer. Besides the intermuscular incision, the operation can also be done under local anesthesia by any other incisions used in appendectomy.

Non-Adhering Surgical Gauze. H. E. FISHER, Chicago. *Journal of the American Medical Association,* March 25, 1916.

Fisher describes the paraffin impregnated gauze used by him as a medium sized mesh material impregnated with boiling paraffin and white petrolatum, and allowed to dry while being constantly agitated so as to get rid of the excess paraffin between the meshes. When dried it is very flexible, and presents a waxed screen when placed in contact with the wound. Fluff dressing is placed above it, and when removed carries away the secretion from the wound, leaving the raw surface practically dry. The paraffin is not absorbed by the tissues and the granulations do not cling or become attached to the waxed surface. The petrolatum seems to make the gauze more flexible, and prevents the hardening and stiffening effect of the paraffin. Its advantages are summed up as follows: "1. It does not become matted with secretions and débris from the wound, owing to its waxed fibers. 2. The paraffin is not absorbed by the tissue. 3. The granulations of tissue repair do not cling or adhere to the waxed gauze, as is the case with all other surgical gauze used. 4. The nonadhering gauze will not adhere to wounds when left on for any great length of time. 5. It stimulates tissue growth. 6. Because of the flexibility of the nonadhering gauze, it closely conforms to the surface to which it is applied. 7. It causes no pain to the patient at the time of application or while it is in place on the wound. 8. No pain or discomfort is caused the patient when it is removed from the wound. 9. Owing to its being a dry dressing and free from matting, it permits of adequate drainage of wound secretions. 10. It is easily and quickly sterilized by immersion in absolute grain alcohol for days without impairing its usefulness. 11. Two years' treatment of wounds of all varieties has shown its decided advantages over all other dressings in use. 12. There is freedom from infections during its use. 13. When allowed to remain on indefinitely, it becomes separated of itself, leaving the healthy, healed wound underneath. 14. By these advantages it hastens the convalescence or healing of wounds. 15. Application to clean surgical operations on the line of suture prevents adherence of the ordinary gauze dressing. 16. It is of value in covering skin graft cases, as it permits freedom of drainage."

Acute Dilatation of the Stomach: Complicating Operations on the Extremities. ISIDORE COHEN, New Orleans. *Annals of Surgery,* March, 1916.

Cohen presents a rather extensive review on this subject, quoting cases and authorities, and then cites five cases from his own records. He discusses at considerable length the theory advanced by others that acute dilatation of the stomach is caused primarily by compression of the duodenum by the root of the mesentery. His conclusion is that the condition is due, most likely, to a disturbance of innervation rather than to a mechanical obstruction. The important facts in support of this theory are: (1) The nerve supply of the stomach and intestines are intimately connected. (2) The inhibitory nerve supply of the stomach and intestines is identical—the splanchnic. (3) Impulse applied to the splanchnics cause a cessation of peristalsis and therefore (4) an acute dilatation of the stomach, etc. (5) Obstruction by the mesentery and its vessels is not present in over fifty per cent. of the cases.

A Note on the Abuses and Dangers of Drainage Tubes. MAJOR G. GREY TURNER, R.A.M.C. (T.) *The British Journal of Surgery,* January, 1916.

The author writes on this subject from a twelve months' active experience in war surgery. He states that a common fault is the use of tubes of colossal size, out of all proportion to the necessities of the particular case. He finds it never necessary, in military surgery, to use tubes larger than the diameter of an ordinary adult little finger. Another error is to allow tubes to remain in the wounds for too long. Very often counter drainage will do away with the need for a very long tube, will be more efficient, and will permit of a much earlier removal of all tubes than if one very long tube were employed.

The greatest danger lies in ulceration and perforation of blood vessels, caused by drainage tubes. This result is nearly always due to sepsis and pressure. He therefore holds it wrong to leave a drainage tube in contact with an artery for more than two days, when the area involved is infected. He boils his rubber drains for ten minutes immediately before using.

Volvulus of Meckel's Diverticulum. A. S. FRASIER, Dothan, Ala. *Journal of the American Medical Association,* April 15, 1916.

Meckel's diverticulum is present in some form in 2 per cent. of individuals, and is a rather common cause of intestinal obstruction. This is pointed out by Frasier, who mentions that when it becomes inflamed the symptoms closely resemble those of appendicitis and may be the cause of serious mistakes in diagnosis, the innocent appendix being removed and the real offender left untouched. The case he reports was diagnosed as acute gangrenous appendicitis with rather unusual obstructive features, probably due to paralytic ileus. The high location of the tenderness and the obstructive feature did not suggest the diverticulum as the cause at the time. Exploration, however, revealed a Meckel's diverticulum 4½ inches long, averaging 2 inches in diameter, coming off about 18 inches above the cecum. It was twisted a complete turn and its distal end enormously distended and adherent to the ileum about 12 inches form its origin. The proximal end communicated with the ileum by an opening 1 inch in diameter. Gangrene was threatened and rupture imminent. The obstruction was believed to be due to ileus dependent in some way on the twist in the diverticulum. The adhesions were freed without difficulty, the diverticulum ligated and removed, the stump inverted and the wound sewed. The patient's convalescence was uneventful.

Cauterization and Fulguration of Bladder Tumors. H. A. KELLY and MR. NEILL, Baltimore. *Journal of the American Medical Association,* March 4, 1916.

Kelly and Neill says that the past ten years have witnessed a remarkable and beneficent change in the treatment of bladder tumors by fulguration, for which credit belongs to Beer. "He has reduced the complex to the category of the simple, always a notable surgical achievement, so that now instead of putting these patients to bed and exposing them to the risks and discomforts of an operation, we treat them as ambulatory office patients and destroy the growth often in from one to several sittings." The greatest benefits are realized in recurrent cases as the patient continues the treatment at intervals until the trouble is finally eradicated, instead of having to undergo a new operation, and a siege in the hospital. There is, nevertheless, a border-line between cases manifestly best for fulguration and a small group which Kelly and Neill are still inclined to reserve for surgery. They believe that the open aerocystoscope (Kelly's) has incontestable advantages for seeing these growths, determining their number and relations, and especially in most cases in enabling the surgeon to see and handle the pedicle and distinguish the pedunculated tumors from apparently sessile and malignant ones, and also to shorten the period of treatment by attacking the pedicle at once. They have found that two slightly diverging needles are valuable for fulguration. They are plunged into the substance of the pedicle and the current turned on as strong as the patient can stand it. They also can use the platinum cautery knives, formerly so much used in throat work, with the open cystoscope with greater advantage.

Vesiculotomy and Vesiculectomy L. E. SCHMIDT, Chicago. *Journal American Medical Association,* January 15, 1916.

Schmidt says that the indications for surgical attack on the seminal vesicles still remain uncertain, though much has been done toward a more thorough understanding. On account of anatomicopathologic conditions, it may

be that vasotomy may not always be of benefit, but on account of its simplicity and the more formidable magnitude of the direct attack on the vesicles it should always be considered, except when it can be ruled out on examination. The pathology of the gonorrheal or secondarily involved vesicles must be similar to that of other organs of like structure. Naturally, the questions of varying virulence of infection arise, as also whether the course is acute or chronic, the questions of obstruction, involvement of other parts, etc. It is probable that the direct or indirect drainage of these organs has not yet received due attention. Schmidt's own observations and those of others show that the gonococcus is not the germ which is the one most often found. It may pave the way for secondary infection, but the organisms of the latter are, in their order of frequency, the staphylococcus and the colon bacillus. The gonococcus may also be present in some chronic cases. As to the symtomatology, Schmidt quotes Belfield, who has grouped all symptoms as referrable to (1) the genital organs, (2) urinary organs, (3) rectum, (4) abdomen, or as (5) systemic. Schmidt holds that an epididymitis is always a positive indication of a vesiculitis on the corresponding side and blood in the semen is equally positive, in his opinion, even if it is not detected by the examining finger. Pains in the testes, groins or perineum or in the region of the vesicles should also be considered. Colicky pains have also been mistaken for ureteral colics and been operated on as such. The urinary symptoms include painful urination, the pain usually terminal, increased frequency, dribbling, colicky pains, etc. Partial or complete retentions are rather common. Rectal symptoms are feelings of itchness, bearing down sensations, etc. Abdominal symptoms are chiefly intestinal in character. Systematic symptoms in acute attacks are chills, fevor, malaise, headache, etc. In regard to operations, he lays stress on avoidance of hasty work and if minor procedures can give relief they should be the methods of choice. When operation is necessary in the acute case and there is no question of pseudo-abscess, and grave symptoms are present, vesiculectomy is the method of choice, and these cases should not be handled too conservatively. In cases of marked infiltration with adhesions, even when systemic symptoms are absent but the bladder involvement is apparent, he favors this operation, as also in cases with colicky pains. Undoubtedly the functional results of the operation have not yet been thoroughly studied, but his impression would be that sterility might easily result. It is likely, however, to result without operation and each case must be analyzed by itself. Schmidt describes the anatomy of these vesicles and gives the technic of the operation that has given him satisfactory results.

Surgical Treatment of Kidney Inflammation. (*Chirurgische Behandlung der Nierenentzündung.*) DR. S. WILK, *Münchener Medizinische Wochenschrift,* January 18, 1916.

Wilk reports four cases of kidney inflammation in soldiers who were otherwise perfectly fit and strong, but who were brought to the military hospital with the symptoms of very severe kidney insufficiency. There was general marked edema; pressure into the skin was comparable to the same in a mass of dough. They had to be turned frequently in bed because prolonged posture caused the parts to be spread out as flat as "pancakes." The serotum was enlarged to the size of a bead, etc. There was diminished urine output; costs and albumin and now and then a red blood cell were seen in the urine. Albumin content of the urine was 8 to 17 promillimeter. The functional tests showed a distinct delay 20 to 30 minutes. The general condition was so bad and medical treatment unavailing, that Wilk subjected these four patients to surgical operation. He decapsulated one kidney only and chose the side which the patient appeared to lie upon and to favor mostly. In two cases the right kidney was decapsulated and in two cases the left kidney. In all four cases there was distinct evidence of perirenal inflammation; thicker and more delicate adhesions bound the capsule to the fat and surrounding connective tissue. The kidney was found enlarged to twice the normal size and in one case with large albumin output to three times the natural size. The capsule was easily split and separated from the cortex. This was found in all cases to be intensely congested and cyanotic. Bleeding was free. This was controlled by continuous irrigation of hot saline solution. The operation was performed by combined local and ether anaesthesia, was borne well by the patients and the convalescence was rapid in each. The general anasorca was rapidly improved; the urinary output almost immediately increased. Hematuria post operative lasted only a few days. The urine cleared up so that after three weeks only faint traces of albumin were detectable; no casts. The patients were put on the ordinary diet to which they had previously been accustomed within three weeks after operation and went on to make a complete recovery.

The decapsulation of one kidney sufficed. The other kidney could also be decapsulated in case of necessity. The procedure is recommended by the author, particularly where internal treatment has failed and especially in the case of soldiers attacked during the war.

The Manual Expression of the Bladder in Injuries of the Spinal Cord. (*Zur manuellen Expression der Blase bei Rückenmarksverletzungen.*) FRITZ ERKES, *Münchener Medizinische Wochenschrift,* No. 7, February, 1916.

Erkes reports a case of vesical paralysis following a shot injury to the spine. The bladder was emptied by uniform pressure applied on all sides of the bladder region. In this way catheterization with its attendant dangers was avoided. There was, however, in the patient whose history is reported a perforation at the fundus of the bladder, which had been tamponaded spontaneously, as it were, by a loop of the sigmoid. The manual emptying of the bladder forced this loop of gut to be separated, with the result that fatal peritonitis set in. The author recommends this procedure only in the immediate interval following the injury to the spine before pathological changes set in within the bladder walls that predispose to rupture.

A Danger of Pyelography. (*Ueber eine Gefahr der Pyelographie.*) PROF. M. SIMMONDS, *Münchener Medizinische Wochenschrift,* No. 7, February 15, 1916.

A patient 34 years of age, with symptoms referable to the right kidney, had an injection of 15 c.c. of 5 per cent. collargol. In three days he was dead with general signs and symptoms of an acute hemorrhagic sepsis. The hemolytic streptococcus was recovered from the blood. The death is therefore not to be ascribed to the collargol itself but rather to the transportation by its medium of septic bacteria from some part of the bladder, urethra or ureter into the blood stream. The collargol solution should therefore not be considered as sufficiently bactericidal. Hence in pyelography a great deal of pains should be taken in determining whether the bladder mucosa is infected, and if so to avoid this procedure; also to avoid injuring the kidney parenchyma by forcible injection of the collargol solution.

The Diagnosis of Genito-Urinary Tuberculosis. J. W. CHURCHMAN, New Haven. *Medical Record,* March 18, 1916.

According to Churchman, an ascending tuberculous infection of the kidney is so rare as to be excluded from consideration. Churchman emphasizes a number of insufficiently appreciated data in connection with tuberculosis of the kidney. 1. That tuberculosis of the kidney may occur in an individual otherwise healthy. 2. That renal symptoms are the exception rather than the rule. 3. That an impalpable kidney is not only no indication of the absence of renal infection, but also is no proof of the absence of enlargement of this organ. The most important diagnostic sign of tuberculous kidney is the presence of tubercle bacilli in the urine. It is possible, however, to find this sign absent. In the female an important diagnostic sign of renal tuberculosis is the palpation of the thickened lower portions of the ureter per vaginam. The cystoscope usually makes the diagnosis easy. Roentgenography is of very little value.

Needless Surgical Operations from Failure to Recognize Tabes Dorsalis. JOHN W. NUZUM, Chicago. *Journal of the American Medical Association,* February 12, 1916.

In the five years from 1910 to 1915 over 1,000 cases of tabes were carefully studied and the records examined to determine the relative frequency of the cardinal symptoms, the number of patients operated on, the frequency of gastric crises, etc. In estimating the number of operations only those cases in which nothing wrong was found and the old symptoms have returned after the operation are included as of the kind here discussed. The mistake is not confined to only one locality, and it was found in the study that such operations are fewer in the larger hospitals than in the smaller ones throughout the United States. Nuzum records 97 operations performed on 87 patients. There were 19 operations on 18 patients for gastric ulcer; 19 operations on 16 patients for gallbladder disease; 18 operations on 17 patients for appendicitis. Eleven patients were operated on 13 times for salpingitis; on 9 patients an exploratory laparotomy was made; 7 operations were performed on 6 patients for renal calculi; 7 operations on 5 patients for postoperative adhesions, and one operation for each of the following: tumor of cauda equina, sciatica, meningocele, ectopic gestation and peritonitis. The crises of tabes must have largely influenced the decision to operate. It appears that the mistaken diagnosis and resulting operations were chiefly in two groups of patients: 1. Tabetics in whom the initial symptoms were the visceral crises and less frequently those with renal or intestinal crises. 2. Tabetics as a class designated by Erb as "tabes incompleta" or "formes frustes" by the French. These present fewer of the characteristic symptoms and mistakes are less surprising. The possibility of bona fide abdominal disease occurring in paretics must be kept in mind, and a case illustrating this is given. Nuzum mentions a recently found symptom very valuable for the early diagnosis of tabes in the marked lymphocytosis in the spinal fluid.

Malignant Disease of the Ovaries. M. F. PORTER, Fort Wayne. *Journal of the American Medical Association,* March 11, 1916.

Porter reports several new observation. While the bilateral tendency of ovarian growths is recognized and some have advised removal of both ovaries when one is necessarily removed because of tumor, Porter, from a quite large experience, has had only one case in which he has been called on for removal of a cyst in the remaining ovary after a previous operation on the other, and he would not advise such removal, as has been recommended in these cases by Clark. He considers that fluid in the abdomen without general anasarca, provided pericarditis and cirrhosis be excluded, calls for exploratory laparotomy in a woman, adult as well as child, and that this is almost imperative. Speaking of tumors generally he would say that negative reports from the laboratory should never be allowed to outweigh, when based on only a few sections, the evidence gained by examination of the gross specimen and from the clinical history. On the other hand, one frequently meets with tumors which give little macroscopic evidence of malignancy, but show it on microscopic examination. While ascites with ovarian tumor indicates malignancy, its absence does not necessarily mean the contrary, nor does such ascites with malignant tumor mean necessarily an involvement of the peritoneum. Just why some of the tumors are accompanied by ascites, and others are not, is not explained. Concerning the influence of malignant ovarian tumors on the menstrual function, cases are met with in which they seem to cause amenorrhea, and others in which they seem to produce menorrhagia or metrorrhagia. These opposite effects, he thinks, may be explained by the overgrowth of the ovarian structure on the one hand and its destruction on the other. In some patients, however, one of these conditions may follow the other and the explanation is not apparent to him. He thinks that we are warranted in concluding that menorrhagia or amenorrhea is much more common in malignant tumors of the ovary than with benign, and that both forms of irregularity are equally indicative of malignancy.

The Bacteriology and Experimental Production of Ovaritis. E. C. ROSENOW and C. H. DAVIS, Chicago. *Journal of the American Medical Association,* April 15, 1916.

Rosenow and Davis publish their findings with cultures made from tissues and the cystic fluid after operations on the ovaries, and give results of animal experiments made with organisms obtained from these cultures. Their results seem to point to the fact that ovarian infection may be of extrapelvic origin instead of direct extension from the genital tract. Their technic was the same as used in the similar studies of other diseases. Shake cultures were made in tall columns of ascites-dextrose agar from one or more portions of the ovary, at least 1 cm. in diameter previously emulsified in a specially devised sterile air chamber. Positive cultures of streptococci, the viridans, and *Staphylococcus albus,* the gonococcus, the colon bacillus, and an aerobic streptothrix were obtained. The Welch bacillus was also obtained in eight patients with fibromyoma of the uterus. The following facts are adduced as supporting the causation of ovarian disease by organisms carried in the blood more often than generally believed: the occurrence of fibrocystic degeneration of the ovaries in a young woman with imperforate vagina, history of tonsillitis followed by symptoms of pelvic infection in a number of patients in the series, the not uncommon occurrence of pelvic infection following anginal attacks during the menstrual period, and the far more frequent occurrence of a so-called idiopathic streptococcal peritonitis following anginal attacks in the female than in the male, the absence of colon bacilli in all but three ovaries of their series, contrary to what was naturally to be expected, and the frequent occurrence of appendicitis, cholecystitis and arthritis in these patients, diseases commonly attributed to streptococci from a distant infection focus. The occurrence of fibrous and cystic degeneration of the ovary secondary to an acute infection is well established, but the cause of this condition without an acute infection has not been previously worked out. The authors have demonstrated streptococci often in pure culture in a large proportion of the ovaries studied, and two of the strains isolated showed marked affinity for the ovary in the experimental animals. Their results do not indicate, however, they think, that excision and resection of the ovary should not be done without due regard to the existence of chronic foci of infection elsewhere where the bacteria may acquire the peculiar properties necessary to infect the ovary. Early eradication of primary foci might in some cases prevent the premature sclerotic degeneration of the ovary.

Tuberculosis of the Mammary Gland. D. GATEWOOD, Chicago. *Interstate Medical Journal,* April, 1916.

1. Tuberculosis of the mammary gland is very uncommon considering the frequency of tuberculosis.
2. The term "primary tuberculous mastitis" should be applied only to those cases in which there is definite evidence that the infection was introduced directly into the breast tissues.
3. The symptoms are varied and the diagnosis should be made certain by the aid of the microscope before radical operations are undertaken.
4. The pathology, although varied, does not differ essentially from that of tuberculosis in other organs.
5. The treatment is surgical in almost every instance, but the postoperative care of the patient is very essential to complete recovery.
6. The prognosis is excellent provided the general condition of the patient is good.

The Ideal Operation for Aneurisms of the Extremity. Report of a Case. B. M. BERNHEIM, Baltimore. *Bulletin of the Johns Hopkins Hospital,* April, 1916.

A man, aged 43, presented himself for an aneurism of the popliteal artery of syphilitic origin. The Moskowicz test revealed insufficient collateral circulation, so that an aneurysmorrhaphy was not considered feasible. At operation the aneurism was found adherent to the popliteal vein. The aneurism was widely opened and the vein separated

from the artery by taking part of the sac wall with it. The aneurism was then excised, leaving a part of the wall in situ, and 12 cm. of the internal saphenous vein was sutured between the divided ends of the popliteal artery; the portion of aneurysmal wall left in situ was used to reinforce the vein. The ultimate result was perfect in every way. This is the first report of the "ideal" operation for aneurism in this country, and only seven have been reported elsewhere.

Subacromial Bursitis and Concretions. W. W. PLUMMER, Buffalo. *New York State Journal of Medicine*, April, 1916.

From a study of five cases Plummer is in full accord with the clinical, pathological and therapeutic observations of Brickner upon this malady. The main points of emphasis to which Brickner has called attention in his publications are the following: 1. That trauma is probably the determining etiological factor. 2. That the bursitis is usually associated with a tear or injury in the supraspinatus or infraspinatus tendon and deposition of lime in or on this tendon. 3. That the lime deposit is therefore under and not in the bursa. 4. That thickened bursae are not visible in radiographs. 5. That in chronic cases the best treatment is by open operation, dividing adhesions in the bursa and removing the deposit beneath. 6. That abduction of the arm after operation is desirable to accelerate a perfect functional result.

Retarded Ossification as an Etiologic Factor in Traumatic Arthritis and Epiphysitis. J. M. BERRY, Albany. *Journal of the American Medical Association*, March 18, 1916.

Retarded ossification as an etiologic factor in traumatic arthritis and epiphysitis is noticed by Berry. He has had the opportunity of observing three cases in which it appeared to be such a factor, and which he reports. The trauma in these cases consists in overstrain of the joints due to abnormal activity, and children that are thus anatomically delayed in development should be restrained from their natural overactivity. Cases of this character, he thinks, are probably quite common and are apt to be overlooked or unrecognized.

Treatment of Tuberculous Arthritis. J. J. NUTT, *American Journal of Orthopedic Surgery*, January, 1916.

The author claims little value for Bier's hyperemic treatment, tuberculin, heliotherapy, or Beck's bismuth paste. He emphasizes the fact that in strict attention to the patient's general condition lies the greatest hope for amelioration of these joint conditions. To outdoor life with properly regulated diet he occasionally adds a milk diet. The patients are permitted to run and play practically as they care to, except for one or two enforced rest periods through the day. Mechanical appliances are readjusted every day if necessary (he prefers the use of braces to plaster jackets). The resistance of the joint is well tested by the removal of all protection, and by frequent examination over a period of six months.

The Conservative Treatment of Gangrene of the Extremities, Due to Thrombo-Angiitis Obliterans. WILLY MEYER, New York. *The Annals of Surgery*, March, 1916.

Meyer presents a careful review of gangrene of the extremities, its etiology, its pathology, and its treatment. He advises that in typical cases of thrombo-angiitis conservative treatment should first be resorted to. (1) Superheated air; best combined with (2) systematic hypodermoclysis of Ringer's solution. One tabloid of Ringer's solution is dissolved in 500 c.c. of *distilled* sterile water. The injections are made every day or every second day up to twenty-four injections. This method, which Meyer designates as the Mayesima-Koga treatment, deserves particular attention, since by its use Meyer has frequently seen improvement. If these two procedures are of no avail, then conservative operative measures are indicated, such as (3) tying the femoral vein, or (4) arteriovenous anastomosis. Finally, there remains amputation as the last resort.

Parapneumonic Empyema. LINTON GERDINE, Chicago. *American Journal of Diseases of Children*, January, 1916.

A consideration of the literature on this subject, and a series of personally observed cases, leads the author to the following conclusions:

Fluid is present in the pleural cavity in a large number of cases of pneumonia before the crisis and can be demonstrated, sometimes by physical signs, sometimes by the Roentgen ray, and by puncture, even when other signs are not apparent. The clinical course of the pneumonia may not be altered by this complication. In the majority of cases the fluid is sero-fibrinous and sterile. True pus is only rarely present and may contain organisms, whose virulence may aid in determining the prognosis. Only in cases with sero-fibrinous and purulent fluids, containing organisms of a high grade of virulence should surgical interference enter into consideration.

A Simple Method of Draining Empyema. J. RANSOHOFF, Cincinnati. *Journal of the American Medical Association*, April 15, 1916.

A simple method of draining empyema and at the same time avoiding the entrance of air into the pleural cavity, which is most distracting to the patient and detrimental to the lung expansion, is described by Ransohoff as follows: "An ordinary drainage tube is slipped into a collapsible soft rubber tube, which must fit accurately about the harder one for a distance of 1 inch or more. The soft tube is that ordinarily employed for cigarette drainage. When the harder tube is accurately fitted into the wound, any effort at inspiration will cause the soft outer tube to collapse and prevent the ingress of air. On the other hand, the pressure of the lung from within, with the normal respiratory movements, will be sufficient to open the collapsible tube and permit the escape of whatever pus may be within the chest. While the drainage is profuse, the collapsible tube can be led into a bottle, which may be changed as often as is necessary. With the decrease of the discharge, the bottle can be dispensed with and the discharge guided into the dressings. It is almost needless to say that the inner drainage tube must be made to fit air-tight into the wound in the intercostal space, whether or not a rib resection has been done. A suture or two through the wound margin and the proximal tube will prevent the latter from slipping into the thorax." In case it is desired to apply suctions through the tube a glass tube fitted to a Potain aspirator can easily be slipped through the collapsible tube into the firmer one without admitting air.

Contribution to the Combating of Collapse in the Exsanguinated. (*Beitrag zur Bekämpfung von Kollapsen bei Ausgebluteten.*) DR. NOWAKOWSKI (from a field hospital), *Münchener Medizinische Wochenschrift*, January 25, 1916.

Two things are emphasized in this paper, 1. The value of rectal infusion by the drop method as superior to subcutaneous and intravenous infusion, being less prone to cause cardiac insufficiency in wounded soldiers already debilitated by the hardships of long marches, hunger, thirst and cold and wet, and 2. The great value of oxygen inhalations at frequent intervals. The latter is especially valuable in combating the severe air-hunger and unconsciousness. It deepens the respirations, stimulates the respiratory centre, not only supplies the gas to the red blood corpuscles but by prolonging the respiratory act permits the red cells to load themselves with the vital gas. The pulse gets fuller at the same time and the patients ask for the inhalations. While the other well recognized measures are to be employed to combat the collapse from exsanguination as camphor and caffein injections, warmth, elevation of the lunar extremities, stimulating fluids by mouth, etc., the greatest benefit comes from the inhalation of oxygen, which should always be at hand, and should be prolonged till the collapse phase has been overcome. Inhalation may be given at periods and may last between 3 and 10 minutes. Should anesthesia be necessary for dressings or operative manipulations the oxygen becomes then a valuable adjunct.

On the Condition of the Vaso-Constrictor Center During the Development of Shock. M. G. SEELIG and DON R. JOSEPH, St. Louis. *Journal of Laboratory and Clinical Medicine,* February, 1916.

1. Denervated bloodvessels usually show the best passive response to intrenal pressure changes when used within 24 hours after their denervation.

2. Normally innervated car vessels are strongly constricted while the animal is sinking into a condition of shock and after shock has developed.

3. This strong vascular constriction persists even though the blood pressure be raised well toward the normal level (at a time when the animal shows distinct symptoms of shock).

4. This vasco-constriction is due to the activity of the vasco-constrictor center because (a) the control denervated vessels become strongly dilated under the influence of the same pressure and (b) the constriction of the normal vessels themselves disappears at once if their connection with the vasco-constrictor center is destroyed by cutting the nerves, or by abolishing their conductivity with ether or by freezing.

5. Since a fairly high degree of activity of the vasco-constrictor center can be demonstrated even after the blood pressure has fallen to a low level and reflexes are sluggish we believe it is justifiable to conclude that a paralysis or failure of the vasco-motor center is not the *primary* cause of the other symptoms of surgical shock.

The Treatment of Acute Toxemia Secondary to Gas Gangrene by the Intravenous Injections of a Solution of Hypochlorous Acid. JOHN FRASER AND H. BATES. *British Medical Journal,* January 15, 1916.

Fraser and Bates have found that many patients with gas bacillus infection die from a profound toxemia, even when the local condition seems to have been arrested. They report three cases in which the improvement after the injection of hypochlorous acid was profound and immediate. The solution employed was lusol containing 0.5 per cent. hyphochlorous acid, to which was added 8.5 grains of sodium chloride to the litre. The injection is made into the median basilic vein by a syringe and the amount is from 40 to 70 c.c.

Types of Hydrocephalus: Their Differentiation and Treatment. CHAS. H. FRAZIER, Philadelphia. *American Journal of Diseases of Children,* February, 1916.

Frazier believes the old classification of hydrocephalus into an internal and an external variety should be given up, and proposes that cases be grouped under four headings, as follows:

1. Hydrocephalus obstructious: This is the old "internal" variety and is due to blocking of one of the outlets for cerebro-spinal fluid. This may be caused by a congenital defect, as absence of the Sylvian aqueduct, or by an inflammation. This group is not as large as was formerly believed and must be differentiated from the other varieties, as the treatment is different.

2. Hydrocephalus nonabsorptus: The absorption of the cerebro-spinal fluid is delayed or defective as proved by the phenolsuphonephthalein test.

3. Hydrocephalus hypersecretivus: This variety is probably due to a diseased condition of the choroid plexes, which structure has been shown to secrete the cerebro-spinal fluid.

4. Hydrocephalus occultus: This condition, occurring usually in children, is characterized by an excess of fluid without any enlargement of the skull. Symptomatically the condition resembles a brain tumor. The author describes in detail such a case—operated upon and relieved.

The author next gives in detail the tests used to determine the variety of hydrocephalus. Phenolsulphonephthalein is injected in the urine estimated; and second, phenolsulphonephthalein is injected into the ventricle and its excretion into the spinal canal is tested for. With these two tests it is possible to localize an obstruction if there is one.

In discussing treatment Frazier advocates in the obstruction type, the puncture of the corpus callosum, as advocated by Anton and Bramann. In the non-absorptive type drainage into the pleural cavity is advocated, though this procedure is still in its developmental stage. When the lesion is due to hypersecretion, thyroid feeding should be prescribed. A case is reported in detail in which thyroid treatment was very successful.

Further Experiences in the Treatment of Hydrocephalus by Cisterna-Sinus Drainage (Author's Operation). IRVING S. HAYNES, PH.B., M.D., New York City. *New York State Journal of Medicine,* April, 1916.

The author discusses the treatment of hydrocephalus by operative procedures and believes that such treatment is logical.

The cerebro-spinal fluid is formed in the lateral ventricles as an active secretion of the choroid plexuses. Its normal course is through the internal channels of the brain and out into the cisterna magna. From here it spreads throughout the entire subarachnoid space, cranial and spinal, and is absorbed by the capillaries of this space, ultimately reaching the cranial sinuses and spinal veins. Hydrocephalus is due to interference in the course of the current or its absorption from the subarachnoid space. Any operation to be successful should reproduce the course of the fluid into the blood stream.

In the writer's operation the object is to drain the fluid from the hydrocephalic cavity at the base of the skull into one of the easily accessible sinuses, the lateral or occipital, if it is large enough, or into the torcular itself. The means is by the use of a small silver cannula of one to two mm. diameter. There is a short arm about one-quarter inch long and a long arm of one to two inches. These arms are bent at right angles to each other. The operation consists of permanently fastening this cannula into the sinus and into the subarachnoid space.

Haynes reports twelve cases in which this operation was done. There were five deaths. The remainder were improved, but none were permanently cured.

A New Method of Treating Tuberculosis and Other Chronic Infected Sinuses. A Preliminary Report. W. O. SWEEK, Phoenix, Arizona. *Interstate Medical Journal,* March, 1916.

The author reports the results of both clinical and experimental tests of a new method of destroying pathogenic organisms in sinuses and other chronic wounds. The wounds are subjected to a germicidal gas produced by passing air through rectified spirits of rosin and then subjecting this to an arc of high electric voltage. The product fresh from the arc has no irritating properties. The time necessary for germicidal action to be complete is twenty minutes for the fresh product and three to five minutes for the aged product. Wound healing is not retarded to any perceptible extent. Infected wounds heal more quickly than with any other known germicide.

Sialolithiasis and Sialodochitis in Childhood. HAROLD NEUHOF, New York. *The American Journal of Diseases of Children,* March, 1916.

Neuhof describes three cases of salivary calculus and two of chronic inflammation of the salivary glands, thus showing that these conditions are not as exceptional in childhood as they have heretofore been considered. The manifestations of stone are more clean-cut and evident in children than in adults, the diagnosis can be made more readily and the surgical treatment is simple and effectual. The salivary duct should be probed in every instance of enlargement of a salivary gland in a child when a definite cause for the enlargement cannot be ascertained.

There is a hitherto undescribed form of sialodochitis of Stenson's duct in children, secondary to inflammation of unknown origin, leading to enlargement of the parotid gland that can be readily mistaken for sarcoma or mixed tumor. The gland is considerably increased in size, firm, nodular and adherent; the orifice and buccal end of the duct are embedded in stenosing cicatricial tissue. There is a tendency to repeated occurrences of the parotid swelling after slitting the mouth of the duct, but cure follows promptly the excision of the diseased end of the duct.